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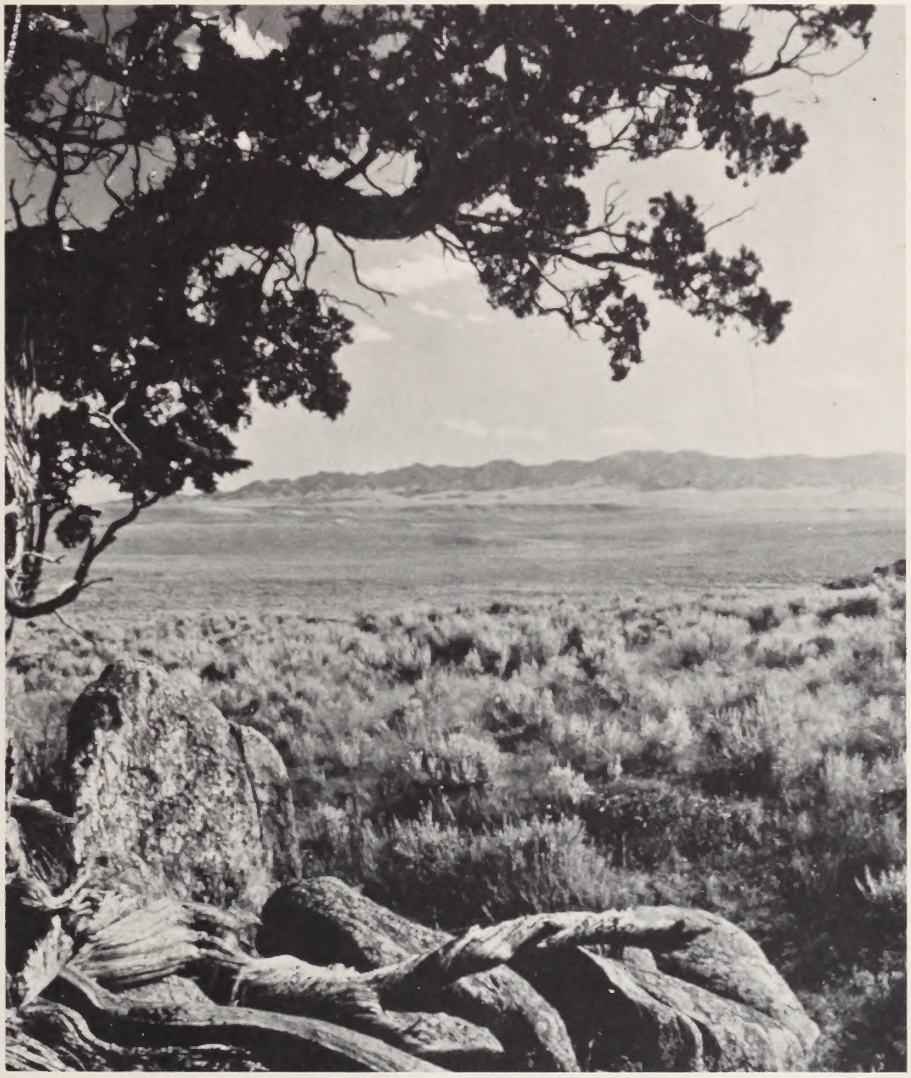

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BUREAU OF LAND MANAGEMENT
State Office
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Cheyenne, Wyoming 82001

NOTICE

The Bureau of Land Management (BLM) proposes to allow livestock grazing on approximately 1,193,184 acres of public land in the BLM Lander Resource Area, Rawlins District, Wyoming. The Proposed Action is to manage grazing allotments at different levels of intensity to maintain present conditions, improve present conditions, or prevent deterioration of present conditions. Proposed actions include changing grazing treatments and seasons of use, making adjustments in use levels, and providing additional grazing management facilities and land treatments. In this environmental impact statement (EIS), four alternatives (Elimination of Livestock Grazing, Enhanced Livestock Grazing, No Action, and Management Based on Currently Available Forage Data) are analyzed along with the Proposed Action. The affected environment is described, and the environmental consequences of the Proposed Action and alternatives are discussed.

Inquiries and comments about this EIS may be made to:

Dale Brubaker		Bob Tigner
Area Manager		EIS Team Leader
BLM Lander Resource Area Office		BLM Rawlins District Office
P.O. Box 589	or	P.O. Box 670
Lander, WY 82520		Rawlins, WY 82301
Telephone: (307) 332-4220		Telephone: (307) 324-7171

Comments must be received by September 2, 1982. All comments will be considered. Those which raise questions or issues concerning the effects of the Proposed Action, present new data, or question facts or analyses contained in this document will be responded to in the final EIS.

Sincerely yours,

Maxwell T. Lieurance

Maxwell T. Lieurance
State Director

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ENVIRONMENTAL IMPACT STATEMENT

PROPOSED GRAZING MANAGEMENT PROGRAM FOR THE GREEN MOUNTAIN EIS AREA

CARBON, FREMONT, NATRONA, AND SWEETWATER COUNTIES, WYOMING

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Denver, CO 80225

Prepared By:

U.S. DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

RAWLINS DISTRICT 1982

Maxwell T. Kinnaman

STATE DIRECTOR

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SUMMARY

This EIS is an analysis of the effects of proposed and alternative livestock grazing management on approximately 1,193,184 acres of public land administered by the BLM Rawlins District in Wyoming. This document will be used to determine future grazing management, based on the principles of multiple use and sustained yield.

AREAS OF CONCERN AND CONTROVERSY

Prior to preparation of the EIS, a scoping process was conducted to identify significant issues. Based on contacts with organizations, individuals, and federal, state, and local agencies, areas of concern and controversy were identified.

Of considerable concern was competition for forage among livestock, wild horses, and wildlife. Apprehensions were expressed about adjustments in livestock numbers based on the forage allocation process. Categorization of allotments into I, M, and C categories concerned some people. Solutions to overuse of the range through changes in seasons-of-use, fences, water developments, sagebrush control, and soil erosion control were discussed. Trespass by livestock and removal of wild horses were issues also. Road improvement was considered important. Another concern was the preservation of historical objects. Land being taken out of forage production because of other uses worried some people. Conflicts between ranchers and the general public (trespassing, littering, gates left open, access to public lands, etc.) were an additional concern. These issues have been considered in the development of the Proposed Action and alternatives and in the analysis of the environmental consequences of these actions.

PROPOSED ACTION AND ALTERNATIVES

Proposed Action

In the rangeland management section of the Green Mountain Management Framework Plan (MFP), the grazing allotments are grouped into categories, and for each category recommendations are made for: an intensity of grazing management, including specific multiple-use resource management objectives; range improvement and monitoring needs; and actions needed to improve and maintain rangeland condition and productivity. Tradeoffs considered in arriving at the recommendations are identified in the analysis found in the MFP. Under the Proposed Action, present management would continue until monitoring results were available. Management actions based on all available data would then be implemented.

Elimination of Livestock Grazing

Under this alternative, livestock grazing would be eliminated from the public lands in the Green Mountain EIS area, and the lands would be managed for other resource values. Damage to watersheds would decrease in most allotments. Wild horse populations would be allowed to increase, and all managed wildlife species would be allowed to increase to population levels identified in the Wyoming Game and Fish Department's Strategic Plan for the Comprehensive Management of Wildlife in Wyoming.

Enhanced Livestock Grazing

Under this alternative, forage available for domestic livestock use would be increased through an accelerated program of range improvements. Suitable allotments would be placed under allotment management plans (AMPs), and livestock would have priority in forage allowances.

No Action

Under this alternative, the existing range management program would be frozen. There would be no new range improvement projects, but maintenance of existing improvements would be allowed. Livestock management actions such as changes in seasons of use, class of livestock, etc., would not be allowed, regardless of need. Wild horse and wildlife numbers would be maintained at current levels through wild horse gathering operations and coordination with the Wyoming Game and Fish Department.

Management Based on Currently Available Forage Data

Under this alternative, currently available forage data would be used, in lieu of monitoring, to establish grazing capacities. Maintenance and construction of range improvements would continue as planned. Plans for livestock and wild horse adjustments would begin immediately. Other management actions would be the same as for the Proposed Action.

Preferred Alternative

The Proposed Action is the preferred alternative.

TIME SCHEDULE FOR RANGE MANAGEMENT ACTIVITIES

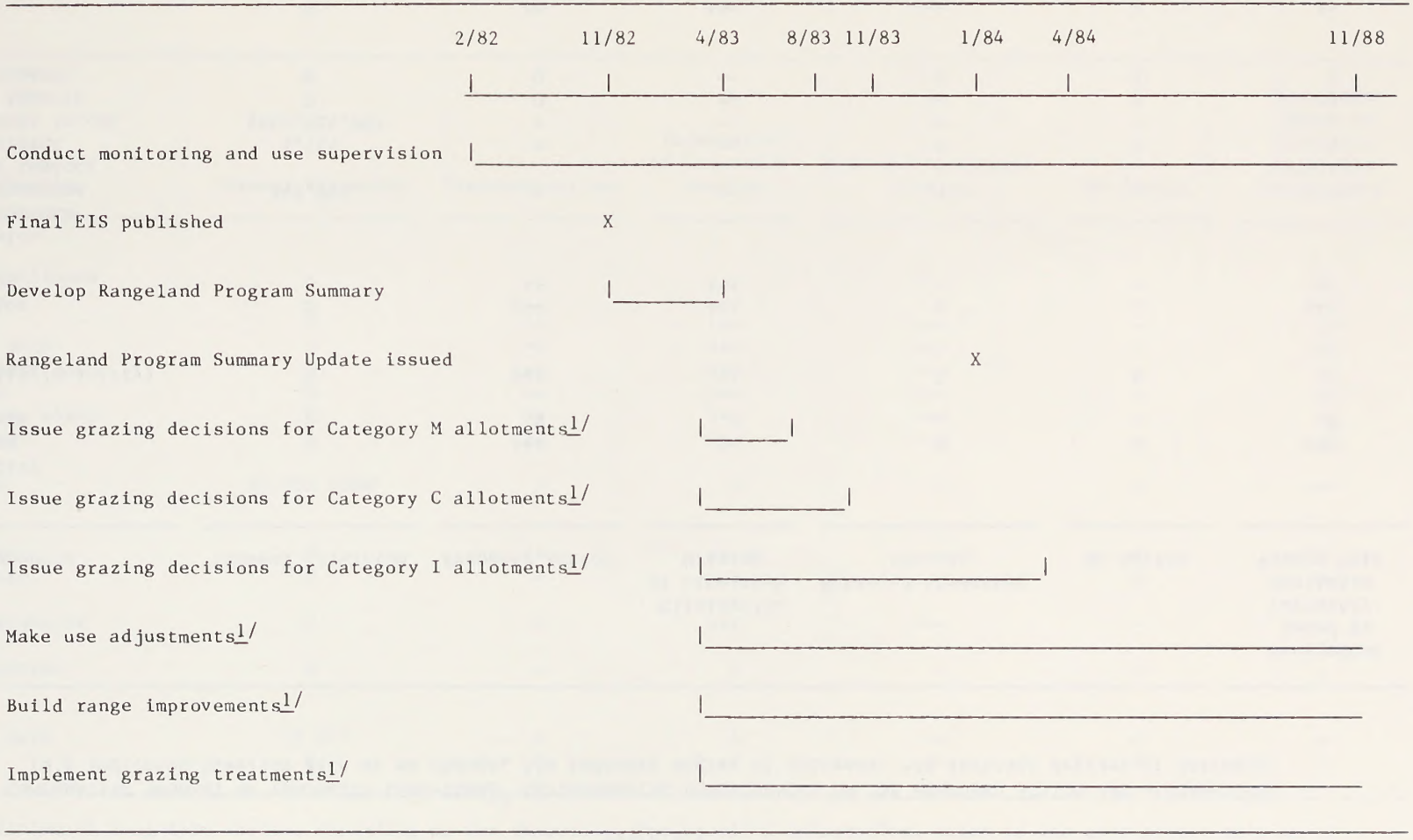
Figure S-1 is a time schedule for various range management activities and proposed activities discussed in this document.

LONG-TERM ENVIRONMENTAL CONSEQUENCES

In Table S-1, the projected long-term environmental consequences of the Proposed Action and alternatives are compared. The information summarized in this table provides a basis for choice among the options for the decisionmaker and the public. For more detailed descriptions of the projected consequences of the Proposed Action and alternatives, refer to Chapter 3, Environmental Consequences.

FIGURE S-1

TIME SCHEDULE FOR RANGE MANAGEMENT ACTIVITIES



1/ Not applicable to the Elimination of Livestock Grazing and No Action alternatives.

TABLE S-1

COMPARATIVE SUMMARY OF PROJECTED LONG-TERM[1/] ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION AND ALTERNATIVES
[0's indicated baseline data or no change, +'s indicate degree of increase, -'s indicate degrees of decrease]

Resource	Present Situation	Proposed Action	Elimination of Livestock Grazing	Enhanced Livestock Grazing	No Action	Management Based on Currently Available Forage Data
Soil stability						
Best case	0	+++	++	+	0	+++
Worst case	0	0	+	-	-	0
Water (Quality/Quantity)	0	+++	++	0	0	+
Vegetation						
Production	0	+++	+++	+	-	+++
Condition	0	++	+++	-	-	++
Socioeconomics						
Direct impacts						
Net revenues	$43,901	+	--	+	-	+
Indirect impacts						
Employment	1,164	+	--	+	-	+
Regional income	$466,025,000	+	--	+	-	+
Related impacts	0	0	++	--	0	0
Social impacts	0	0	--	0	0	0
Wildlife						
Nongame	0	++	+++	---	-	++
Small game	0	++	+++	--	-	++

TABLE S-1--CONTINUED

COMPARATIVE SUMMARY OF PROJECTED LONG-TERM[1/] ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION AND ALTERNATIVES

Resource	Present Situation	Proposed Action	Elimination of Livestock Grazing	Enhanced Livestock Grazing	No Action	Management Based on Currently Available Forage Data
Wildlife--Continued						
Big Game						
Elk	0	++	+++	---	-	++
Mule deer	0	++	+++	---	-	++
Antelope	0	++	+++	---	-	++
Moose	0	++	+++	---	-	++
Bighorn sheep	0	++	+++	---	-	++
Game birds	0	++	+++	---	-	++
Wild horses	19,952 AUMs	+	+	-	0	---
Fisheries						
Best case	0	++	+++	+	0	+
Worst case	0	+	+++	-	0	0
Cultural resources	0	+	+++	---	-	+
Visual resources	0	-	+	-	0	-
Recreation						
Visitor days	22,327	+	+	--	0	+
Quality	0	0	+	---	0	0

[1/] The definition of long-term varies, depending on the resource. For specific information, refer to the appropriate section of Chapter 3, Environmental Consequences.

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BLM beaver pond inventories

BLM Manual

BLM reservoir maintenance inventories

BLM resource area maps

BLM site files

BLM stream inventories

BLM Stream Survey Files, 1975-1977

Classification and Multiple-Use Act of 1964

Clean Air Act of 1977

Code of Federal Regulations (CFR) 40

Endangered Species Act of 1973

Executive Order 12088

Federal Land Policy and Management Act of 1976

Federal Water Pollution Control Act Amendment of 1972

Final Grazing Management Policy (BLM Instruction Memorandum No. 82-292)

Forage distribution computer model

Green Mountain MFP

Green Mountain MFP-1

Green Mountain MFP-2

Green Mountain Weight Estimate Forage Survey

Interim Management Policy and Guidelines for Lands under Wilderness Review

Moneta Planning Unit URA-3

National Environmental Policy Act of 1969

National Register of Historic Places

Natural Resources Defense Council et al. versus Morton et al. (1974 federal court action)

Plant phenology study (1979)

Precipitation and production data collected by the University of Wyoming (1965 to 1979)

Programmatic Memorandum of Agreement between the Department of the Interior, Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers regarding the Livestock Grazing and Range Improvement Program

Public Rangelands Improvement Act of 1978

PUF tables

Rangeland Programmatic Memorandum of Agreement with the Advisory Council on Historic Places (BLM Instruction Memorandum No. 80-369)

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SCS Range Site Descriptions

Sediment Yield Rating System

Seven Lakes Grazing Environmental Statement

Sikes Act of 1974

Soil survey reports

Soils maps

Standard Habitat Site Classification: Overland EIS Area, September 1981

Strategic Plan for the Comprehensive Management of Wildlife in Wyoming

SVIM study data, maps, and references

Sweetwater Planning Unit URA-3

Taylor Grazing Act of 1934

Wild Free-Roaming Horse and Burro Act of 1971

Wyoming Game and Fish Department classification of streams (1977)

CHAPTER 1

PROPOSED ACTION AND ALTERNATIVES

PURPOSE AND NEED

The purpose of a rangeland management program for public lands is to provide guidelines for managing rangeland resources and related ecosystems, including air, soil, water, vegetation, wildlife and fisheries habitat, wild horses, and livestock. A program is needed to enable BLM to protect the public land and resources under its jurisdiction from unnecessary damage; stabilize the livestock industry dependent on public land; and provide for orderly use, improvement, development, and reclamation of public lands for livestock grazing, consistent with multiple-use management objectives for these lands. This responsibility and authority evolves from a series of legal and judicial mandates, including the Taylor Grazing Act of 1934 (43 USC 315-315r), the Classification and Multiple-Use Act of 1964 (Public Law 88-6071), the National Environmental Policy Act of 1969 (Public Law 91-190), the Federal Land Policy and Management Act of 1976 (Public Law 94-579), the Public Rangelands Improvement Act of 1978 (Public Law 95-514), and the 1974 federal court action of the Natural Resources Defense Council et al. versus Morton et al.

The proposed rangeland management for the EIS area was formulated through the BLM planning system, specifically the Green Mountain MFP. Resource problems and possible solutions were identified and analyzed to determine effects on other resources. The resulting multiple-use MFP recommendations are the basis for the Proposed Action. BLM permittees, the Wyoming Game and Fish Department, and special interest groups were consulted during the process. The MFP recommendations were presented to the public for comment in November 1981.

The following range management goals or objectives were identified through the planning system or are required by law:

1. Provide enough forage on a sustained-yield basis to satisfy at least the present demands of livestock, wild horses, and wildlife.
2. Maintain range condition at a level which would provide for a sustained yield of forage production.
3. Maintain and improve terrestrial, aquatic, and riparian ecosystems to provide wildlife with adequate amounts of forage and habitat to maintain existing populations and planned increases.

BLM has adopted a comprehensive new grazing management policy which involves assignment of management priorities to groups of allotments, within the context of the existing planning system. The approach is called selective management. Selective management is based on the identification of allotments or areas sharing similar resource characteristics, management needs, and resource and economic potential for improvement. Allotments are identified as belonging to one of three categories: Category M allotments, for which our objective is to maintain their currently satisfactory condition; Category I allotments, for which our objective is to improve their currently unsatisfactory condition; and Category C allotments, for which our objective is to manage them custodially, while still protecting existing resource values. Proposed actions for managing allotments within each category evolve from their current resource situation. The details of the new policy are contained in BLM Instruction Memorandum No. 82-292, Final Grazing Management Policy.

Five possible actions are analyzed in this EIS. The Proposed Action is analyzed to show the results of implementing the new rangeland management policy in the Green Mountain EIS area, as part of the Green Mountain MFP. The Elimination of Livestock Grazing and No Action alternatives are analyzed to satisfy Council of Environmental Quality regulations and provide a range of grazing management levels, even though they may not meet the stated objectives of the new rangeland policy. The Enhanced Livestock Grazing alternative is analyzed to illustrate the upper limits of livestock use and the effects of such action on other resource values. The Management Based on Currently Available Forage Data alternative is analyzed to show the results of adjusting wild horse numbers downward and of making rapid adjustments in numbers of other grazing animals, while implementing other management actions in the same manner as for the Proposed Action.

Following the completion of this EIS, environmental assessments will be prepared prior to implementation of any actions which would have impacts not covered in the EIS. These environmental assessments will be prepared, at the AMP level, on types of actions or individual actions, as the situation requires.

BACKGROUND

The EIS area contains a total of 1,432,180 acres (including 1,193,184 acres of public land) and is located in central Wyoming (Map 1-1). It is primarily a solid block of public land. A small part of the area, near Lander, is largely private land with scattered blocks of public land. The area as a whole is noted for its diversity of natural resources such as minerals, wildlife, forests, livestock grazing lands, watersheds, and scenic and historical features. Most of the historic sites in the area are connected with early mining activities and the westward migration along the Oregon and associated trails. The area is generally undeveloped except for the communities of Lander and Jeffrey City, the mining areas of Atlantic City and South Pass City, oil and gas fields, and scattered ranches.

Energy exploration and development activities have been increasing in the EIS area. The oldest oil field in Wyoming is within the EIS area along with several other oil and gas fields. Considerable new oil and gas exploration and drilling is being undertaken. Uranium is being mined in the Crooks Gap area, and uranium exploration is being conducted in that region and other parts of the EIS area. Gold mining is still occurring in the Atlantic City and South Pass City areas.

There are 96 operators using the 157 grazing allotments in the area. See Map 1-2 (located in Volume 2 of this EIS) for the allotment boundaries and land status.

APPLICATION OF THE NEW GRAZING MANAGEMENT POLICY TO THE EIS AREA

The allotments in the EIS area have been categorized in accordance with the new BLM Grazing Management Policy. The following is a discussion of the categorization process and other actions that would occur with implementation of the policy. These actions apply to the Proposed Action and the Enhanced Livestock Grazing and Management Based on Currently Available Forage Data alternatives. They do not apply to the Elimination of Livestock Grazing and No Action alternatives.

Allotment Categorization

To achieve the identified objectives and resolve resource problems, the first step in formulating the Green Mountain MFP was to place the grazing allotments into one of the three management categories (M, C, or I).

Category M Characteristics

For Category M allotments, the principal objective is to maintain or improve the existing situation. Present range condition and management is satisfactory. The allotment is producing at or near its potential for vegetation productivity, and there are no, or very limited, land-use or resource conflicts. The potential exists for positive economic return on public investments. Table 1-1 shows the Category M allotments.

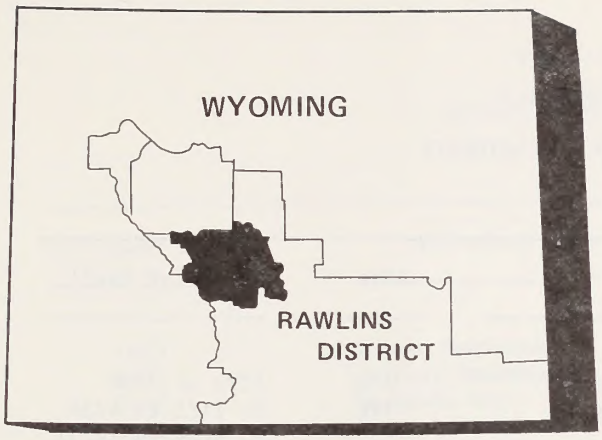
Category C Characteristics

For Category C allotments, the principal short term objective is to prevent deterioration of current resource conditions by managing the lands in a custodial manner with prescribed flexibility for livestock operations. Present range condition has stabilized. Vegetation production on these allotments is low, and potential for improved productivity is limited by economic and physical criteria. Resource conflicts are limited, and there is no present likelihood of positive economic return on public investments. Table 1-2 shows the Category C allotments.

Category I Characteristics

For Category I allotments, the principal objective is to improve existing resource conditions. Present range condition is fair to poor, and range condition trend appears to be downward. Present grazing management practices are inadequate to meet long term resource objectives, and resource conflicts are evident. These allotments have potential for medium to high vegetative productivity, but are not producing near their potential; vegetative productivity is only low to fair. There is a potential for positive economic return on public investments.

Map 1-1
GENERAL LOCATION MAP
Green Mountain Grazing
Environmental Impact Statement



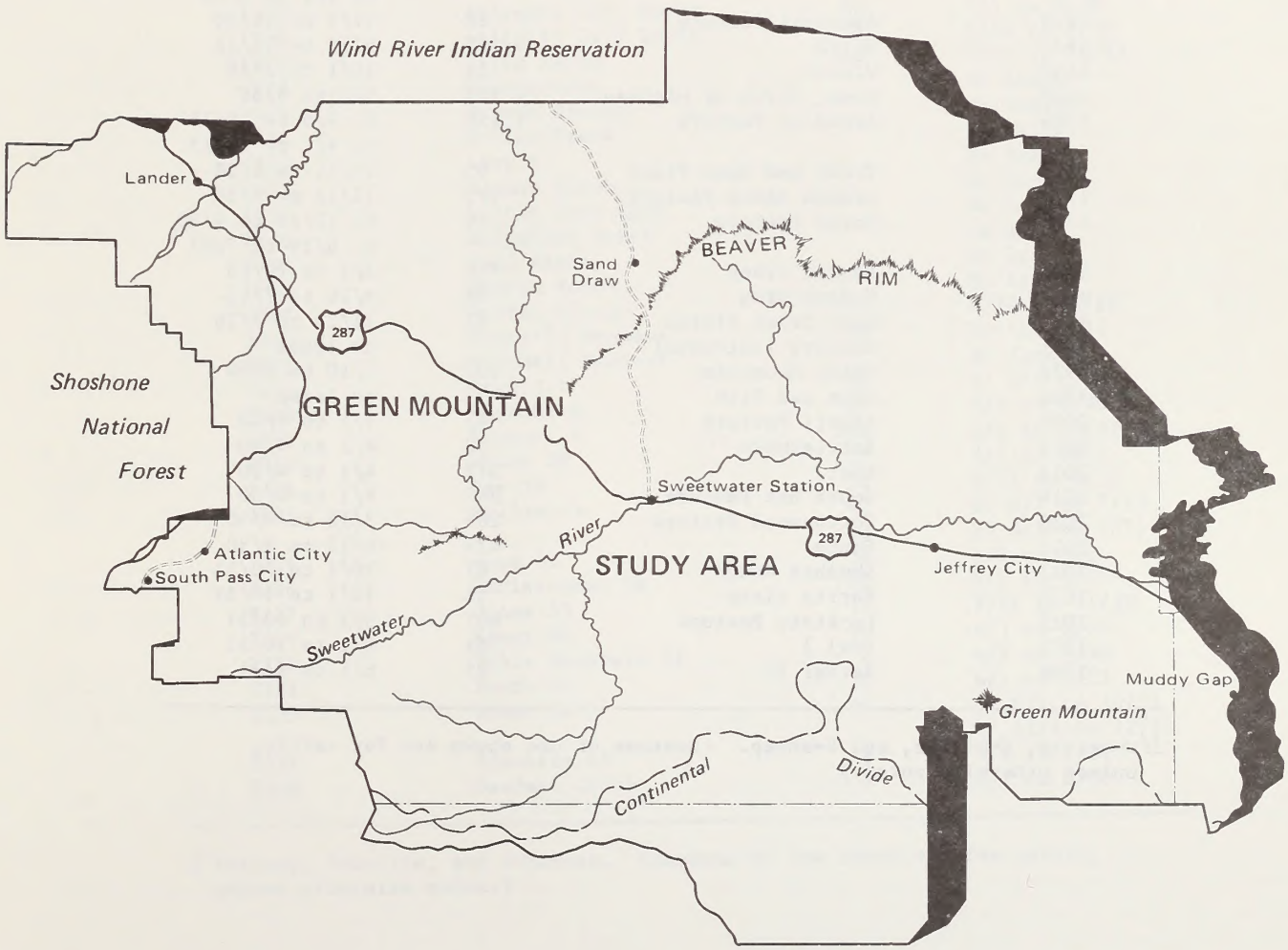


TABLE 1-1

CATEGORY M ALLOTMENTS

Allotment Number	Allotment Name	AUMs	Season of Use[1/]
1414	Anderson Winter	770	12/1 to 4/30
1625	Jamerman Pastures	478	C: 11/1 to 4/30 H: 6/28 to 10/31
1626	Winter Pastures	113	12/1 to 12/31
1627	Individual	301	10/16 to 3/31
1628	Sagehen	189	C: 5/1 to 9/30 H: 5/1 to 2/28
1630	Tram Road	130	5/1 to 5/31
1632	North Hat	180	C: 4/1 to 4/30 H: 6/1 to 8/31
1634	Arkansas Pasture	28	11/1 to 11/30
1637	North	165	5/11 to 11/14
1638	Winter	28	10/1 to 2/28
1660	Home, North of Highway	205	5/1 to 9/30
1704	Breeding Pasture	1,956	C: 4/3 to 11/15 H: 4/1 to 12/15
1706	Trent and Home Place	35	11/15 to 2/28
1710	Graham Ranch Pasture	175	11/15 to 4/30
1715	Horse Pasture	14	H: 12/16 to 4/30 S: 6/29 to 7/07
1806	Beaver Creek	714	5/1 to 10/15
1808	Hudson Draw	38	4/16 to 7/15
1925	Hall Creek Winter	87	11/23 to 2/28
1931	Woolery Individual		no lease
1932	Sheep Mountain	103	5/10 to 6/30
1936	Game and Fish		no lease
2009	Alkali Pasture	47	5/1 to 9/30
2010	Rattlesnake	58	4/1 to 4/30
2012	East	377	4/1 to 4/30
2014	South Hat Pasture	287	4/1 to 4/30
2020	Cottonwood Pasture	265	3/16 to 4/30
2022	South	425	6/15 to 9/30
2023	Sheehan Ranch	67	10/1 to 10/31
2024	Harris Place	16	10/1 to 10/31
2025	Leckinby Pasture	607	5/1 to 10/31
2201	Dusl 1	361	6/1 to 10/31
2208	Barber 21	85	6/1 to 8/31

[1/] C=cattle, H=horses, and S=sheep. (Seasons of use shown are for cattle, unless otherwise noted.)

TABLE 1-2

CATEGORY C ALLOTMENTS

Allotment Number	Allotment Name	AUMs	Season of Use[1/]
1629	Winter Pastures	276	3/1 to 4/30
1631	Claytor Homestead	6	3/1 to 3/31
1633	Stampede Bog	55	10/1 to 12/31
1702	Flagg Individual	51	12/1 to 2/28
1712	Long Creek Sweetwater	66	11/1 to 2/28
1714	Scarlett Pasture	79	10/1 to 2/28
1809	Bringolf Ranch	91	11/1 to 2/28
1810	Yellowstone Ranch	92	11/1 to 2/28
		474	11/1 to 12/31
1813	Blue Ridge		No lease
1912	Twin Creek Pasture	98	5/16 to 10/15
1923	Atlantic City Upper	81	9/1 to 9/30
1924	Atlantic City Lower	58	5/16 to 9/30
1927	Ellis Ranch	229	9/15 to 12/31
1928	Slough Lake		No lease
1929	Barras Spring		No lease
1930	Willow Creek		No lease
1933	Lazy Y		No lease
1935	Bowman Ranch		No lease
1937	Little Popo Agie		No lease
1938	Bergstedt Ranch		No lease
1939	Auer Ranch		No lease
1940	Henton Ranch		No lease
2002	Harris Slough	5	4/20 to 5/19
2016	State-71 Meadows	51	5/1 to 5/31
2028	Mitchell Pasture		No lease
2202	Arnold 4	16	S: 5/1 to 7/1
2203	Hancock 6	47	6/5 to 9/30
2204	Hancock 9	204	5/1 to 10/31
2212	Frank 28	117	5/1 to 11/1
2216	Day 39	10	5/15 to 9/30
2221	Hallam 45	40	C: 6/1 to 7/15
		30	S: 6/1 to 7/15
2224	Auer 52	54	5/1 to 8/1
2226	Christensen 54	12	6/1 to 9/30
2227	Jones 55	17	9/16 to 11/30
2229	Kaper 59	56	6/1 to 9/30
2230	Table Mountain 61	8	6/1 to 9/30
2231	Booth 62	30	6/1 to 6/21
2233	Weber 64	96	C: 6/1 to 10/31 H: 12/1 to 12/15
2234	Sjostrom 66	18	6/1 to 8/31
2238	Deadman Gulch	4	6/1 to 8/30

[1/] S=sheep, C=cattle, and H=horses. (Seasons of use shown are for cattle, unless otherwise noted.)

Categorization Factors

Category M and I Allotments. A number of items were considered in the categorization process for Category M and I allotments. Most important were the experience, observations, records, current rangeland policy, and available range information from the Lander Resource Area, coupled with the permittees' knowledge and experience. Eighty-six percent of the permittees in the EIS area were consulted.

The following nine factors were used in the categorization process:

Factor 1. Range survey results indicate vegetative production is not satisfactory, key species are not present in satisfactory amounts, and species composition indicates less than satisfactory range condition.

Factor 2. Allotment evaluation indicates utilization, trend, and condition of the vegetative resource is not satisfactory.

Factor 3. Allotment analysis shows significant forage competition between grazing animals and indicates present levels of livestock and management objective levels of other grazing animals cannot be accomodated.

Factor 4. The distribution of grazing animals is not satisfactory. Significant problems exist around wetlands, riparian areas, and meadows.

Factor 5. Turnout dates and seasons of use are not consistent with range readiness and sound range management principles.

Factor 6. Significant conflicts with other land uses are evident.

Factor 7. Based on analysis of soil survey data, the allotment is judged to have potential for high vegetative productivity but is not producing at or near potential.

Factor 8. Same as Factor 7, except based on analysis of range survey data on vegetative composition.

Factor 9. There is potential for positive economic return on public investments and, based on factors 7 and 8, there is potential for range improvement through grazing treatments.

Table 1-3 shows the factors that applied to each allotment.

The Category I allotments were further divided into four monitoring/implementation priority groups (very high, high, moderate, and low), based on the categorization factors, input from affected parties, and Lander Resource Area personnel experience. The allotments in each group are shown in Tables 1-4, 1-5, 1-6, and 1-7. The number of factors used in the process of assigning priorities was not a major element in the decision. For example, even though seven factors might have been used in placing an allotment in the I category, perhaps only 1 critical factor was used to place that allotment in the very high priority group.

Category C Allotments. The criteria for placing allotments into Category C were applied in the following way:

1. The allotment was evaluated to determine whether the land ownership and use pattern within and surrounding the allotment negated effectiveness and return to public investment because:

   a. The public land pattern was isolated and of noncontiguous tracts.

   b. Existing or imminent nonconforming land use (such as subdivisions) bordered the public land.

   c. The allotment had little or no potential for vegetative improvement.

   There are virtually no allotments in the Green Mountain EIS Area with such low potential for vegetative production that attempts to improve their condition would be physically or economically infeasible. There are, however, allotments with land ownership patterns which negate the possibility for economic return on federal investment in range improvements.

2. The allotment was evaluated to determine whether there were critical resource conflicts or public concern for the resources in the allotment. It was decided that the allotment had no critical conflicts or concerns if:

   a. There were no legislatively protected or mandated resources such as endangered species, wetland-riparian areas, or wild horses in the allotment.

   b. There had been no significant expressions of public concern for the resources in the allotment.

   If critical conflicts or concerns were evident, the allotment was not placed in Category C.

Monitoring and Use Supervision

BLM would conduct use supervision and monitoring on the Category I allotments first. The order in which the Category I allotments would be monitored and the intensity of monitoring would be based on the priority groups (i.e., very high priority allotments would be monitored first and would receive the most intense monitoring). If money and

TABLE 1-3

FACTORS USED IN CATEGORIZATION OF CATEGORY I ALLOTMENTS

Allotment Number	Allotment Name	Factor 1 1/	Factor 2 2/	Factor 3 3/	Factor 4 4/	Factor 5 5/	Factor 6 6/	Factor 7 7/	Factor 8 8/	Factor 9 9/
1401	Rim Pasture	X		X	X			X	X	X
1403	Conant Creek Common	X		X	X			X	X	X
1409	Muskrat Open	X		X	X			X	X	X
1412	Poston Complex	X			X			X	X	X
1413	Pipeline Pasture	X			X			X	X	X
1415	Crofts Individual							X	X	X
1622	Lankin Creek				X			X	X	X
1623	Murphree Pastures	X			X			X	X	X
1635	Big Rock Pasture	X			X			X	X	X
1636	Granite Mountain Open	X		X	X	X		X	X	X
1701	Flagg AMP	X				X		X	X	X
1703	Big Pasture	X		X		X		X	X	X
1705	Myers Fenced Pasture	X						X	X	X
1707	Ice Slough	X			X	X		X	X	X
1708	Long Creek Outside	X				X		X	X	X
1709	Long Creek Pastures	X			X			X	X	X
1711	Countryman Fenced	X						X	X	X
1713	Whitlock Fenced	X						X	X	X
1801	East Beaver Common				X		X	X	X	X
1802	Bringolf AMP	X					X	X	X	X
1803	Government Draw				X		X	X	X	X
1804	Government Draw-Lower Beaver				X			X	X	X
1805	Kirby-Reservation Boundary	X X						X X	X X	X X
1807	Baldwin Pasture	X			X			X	X	X
1811	Lander Valley									

TABLE 1-3--CONTINUED

FACTORS USED IN CATEGORIZATION OF CATEGORY I ALLOTMENTS

Allotment Number	Allotment Name	Factor 1 1/	Factor 2 2/	Factor 3 3/	Factor 4 4/	Factor 5 5/	Factor 6 6/	Factor 7 7/	Factor 8 8/	Factor 9 9/
1812	Ninemile				X			X	X	X
1901	Atlantic City Common		X		X	X	X	X	X	X
1902	Cottonwood Basin	X			X	X		X	X	X
1903	Silver Creek Common	X			X	X		X	X	X
1904	Devils Canyon AMP	X				X		X	X	X
1905	Ellis-Upper Beaver AMP	X		X	X	X		X	X	X
1906	Twin Creek Individual	X			X			X	X	X
1907	Commissary Hill				X	X		X	X	X
1908	Slingerland AMP	X		X	X	X		X	X	X
1909	Lee's Onion Flat	X						X	X	X
1910	Lee's Sawmill Basin	X		X		X		X	X	X
1911	Red Canyon AMP	X		X		X		X	X	X
1913	McGraw Flat Individual	X			X			X	X	X
1914	McGraw Flat Common	X			X	X		X	X	X
1915	Beaver AMP	X			X	X		X	X	X
1916	Hall Creek	X			X			X	X	X
1917	Mazet's Onion Flat	X			X			X	X	X
1918	McGraw Flat-Upper Beaver	X		X	X			X	X	X
1919	Reed-Kaper	X				X		X	X	X
1920	Salisbury AMP	X				X		X	X	X
1921	Level Meadows	X				X		X	X	X
1922	P Heart Individual	X			X	X		X	X	X
1926	McKinney Individual	X		X		X		X	X	X
1934	Red Canyon Rim				X			X	X	X
1941	McKinney							X	X	X

TABLE 1-3--CONTINUED

FACTORS USED IN CATEGORIZATION OF CATEGORY 1 ALLOTMENTS

Allotment Number	Allotment Name	Factor 1 1/	Factor 2 2/	Factor 3 3/	Factor 4 4/	Factor 5 5/	Factor 6 6/	Factor 7 7/	Factor 8 8/	Factor 9 9/
2001	Green Mountain Common	X		X	X	X	X	X	X	X
2003	Whiskey Peak	X		X	X			X	X	X
2004	Green Mountain Fenced	X	X		X	X		X	X	X
2005	Home, South of Highway	X			X	X		X	X	X
2006	46 Pasture	X						X	X	X
2007	Rigby Pasture	X			X	X		X	X	X
2011	Highway	X			X	X		X	X	X
2013	Fenced	X			X	X		X	X	X
2015	Hadsell Pasture		X					X	X	X
2018	Alma Grieve Pasture	X		X				X	X	X
2019	Cooper Creek	X						X	X	X
2021	Willow Creek	X						X	X	X
2026	Little Camp Creek	X			X			X	X	X
2205	Hopkins 13	X			X			X	X	X
2206	Krone 17	X			X			X	X	X
2207	Steers 19	X		X	X			X	X	X
2209	Weed Draw				X			X	X	X
2210	Holy Cross 10	X		X	X			X	X	X
2211	Strube 26	X		X	X			X	X	X
2213	Spriggs 36	X		X	X			X	X	X
2214	Double A 37	X		X				X	X	X
2215	Wunder 38	X		X	X		X	X	X	X
2217	Nicholas 40	X		X	X			X	X	X
2218	Double A 41	X						X	X	X
2219	Slingerland 43	X		X	X			X	X	X
2220	North Fork Land & Development	X		X	X			X	X	X
2222	Strube	X			X			X	X	X

TABLE 1-3--CONTINUED

FACTORS USED IN CATEGORIZATION OF CATEGORY I ALLOTMENTS

Allotment Number	Allotment Name	Factor 1 1/	Factor 2 2/	Factor 3 3/	Factor 4 4/	Factor 5 5/	Factor 6 6/	Factor 7 7/	Factor 8 8/	Factor 9 9/
2223	Ross 51				X			X	X	X
2225	Crump 53	X			X			X	X	X
2228	Spriggs 57	X			X			X	X	X
2232	Hancock 63	X		X				X	X	X
2235	Horny Toad			X	X			X	X	X
2236	Hart 70	X			X			X	X	X
2239	Cyclone Pass				X			X	X	X
2240	Harvey Basin	X		X	X			X	X	X

1/ Range survey results indicate vegetative production is not satisfactory, key species are not present in satisfactory amounts, and species composition is less than satisfactory range condition.
2/ Allotment evaluation indicates utilization, trend, and condition of the vegetative resource is not satisfactory.
3/ Allotment analysis shows significant forage competition between grazing animals and indicates present levels of livestock and management objective levels of other grazing animals cannot be accomodated.
4/ The distribution of grazing animals is not satisfactory. Significant problems exist around wetlands, riparian areas, and meadows.
5/ Turnout dates and seasons of use are not consistent with range readiness and sound range management principles.
6/ Significant conflicts with other land uses are evident.
7/ Based on analysis of soil survey data, the allotment is judged to have potential for high vegetative productivity but is not producing at or near potential.
8/ Same as Factor 7, except based on analysis of range survey data on vegetative composition.
9/ There is potential for positive economic return on public investments and, based on Factors 7 and 8, there is potential for range improvement through grazing treatments.

personnel were available after monitoring the Category I allotments, the allotments in the M and C categories would be monitored as the need became apparent. BLM would conduct low to high intensity monitoring on the Category M allotments, depending on the values of all resources in each specific allotment. On Category C allotments, BLM would conduct low intensity monitoring.

Short-term monitoring would be conducted to determine utilization of key forage plants, estimates of current annual use for all grazing animals, and plant phenology and range readiness. Long-term monitoring would be conducted to study range trend, exclosures on riparian areas, climate (precipitation and temperature), water quality and quantity, soil movement, threatened and endangered plants, wild horse populations, and wetlands.

Grazing Decisions

Grazing decisions would be made after adequate information became available. For Category M allotments, this would be in 5 to 9 months after the final EIS is published; for Category C allotments, in 5 to 12 months after the final EIS is published; and for Category I allotments, in 5 to 17 months after the final EIS is published.

Implementation of Management Actions

Under the Proposed Action and the Enhanced Livestock Grazing alternative, present management of the allotments (as shown in Appendix 1; Tables 1-1, 1-2, 1-4, 1-5, 1-6, and 1-7; Step 3 of the unit resource analysis (URA-3) for the Moneta Planning Unit; and the Sweetwater Planning Unit URA-3) would continue until monitoring indicated changes needed, then implementation of management actions would begin. Implementation for the Management Based on Currently Available Forage Data alternative would begin following issuance of grazing decisions.

AMPs, Habitat Management Plans, Herd Management Area Plans, etc., would be developed; environmental assessments would be done; and range improvements would be made. The funding for range improvements would be allocated to the Category I allotments first. Improvements would be done on the M and C category allotments as personnel and funds permitted. If livestock adjustments were necessary, one-half the proposed adjustment would be made initially and after two years, the situation would be reevaluated to determine the proper adjustment. Adjustments in turnout dates and seasons of use would be phased in over a period of several years.

RANGELAND PROGRAM SUMMARY

A Rangeland Program Summary (RPS) of the planning objectives and proposed decisions for all rangeland uses will be developed within 5 months after the final EIS is published. The RPS will contain a description of planning decisions that affect livestock grazing, the relationship of those decisions to the Proposed Action and alternatives analyzed in the EIS, and the costs and benefits of the rangeland program. The RPS will also contain a summary of the monitoring program for the area. A schedule for issuance of grazing decisions by allotment and a description of the procedures and time available for all affected parties to express their views will be included in the RPS.

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The Proposed Action for rangeland management in the EIS area and four alternatives to the Proposed Action are described below. Table 1-8 shows total forage supply for Category I allotments and demand for the Proposed Action and alternatives; the demand is broken down by allotment in Appendix 2.

Proposed Action

In the rangeland management section of the Green Mountain MFP, the grazing allotments are grouped into categories, and for each category recommendations are made for: an intensity of grazing management, including specific multiple-use resource management objectives; range improvement and monitoring needs; and actions needed to improve and maintain rangeland condition and productivity. Under the Proposed Action, present management (as shown in Appendix 1; Tables 1-1, 1-2, 1-4, 1-5, 1-6, and 1-7; the Moneta Planning Unit URA-3; and the Sweetwater Planning Unit URA-3) would continue until monitoring results were available. Management actions based on these results would then be implemented. Tradeoffs considered

TABLE 1-4

VERY HIGH PRIORITY CATEGORY I ALLOTMENTS

Allotment Number	Allotment Name	AUMs	Season of Use[1/]
1401	Rim Pasture	3,316	C: 5/1 to 11/30
		789	S: 6/1 to 6/30
			S: 10/16 to 11/16
1403	Conant Creek Common	4,906	C: 5/1 to 11/30
		3,081	S: 11/17 to 5/30
1623	Murphree Pastures	1,061	3/15 to 8/30
1636	Granite Mountain Open	12,583	5/11 to 11/14
1711	Countryman Fenced	216	11/15 to 4/30
1807	Baldwin Pasture	105	5/1 to 5/30
1812	Ninemile	516	5/1 to 10/31
1902	Cottonwood Basin	705	4/1 to 2/28
1910	Lee's Sawmill Basin	558	5/1 to 10/15
1911	Red Canyon AMP	775	5/16 to 9/30
1913	McGraw Flat Individual	206	6/1 to 9/30
1914	McGraw Flat Common	1,824	5/1 to 10/31
1918	McGraw Flat-Upper Beaver	1,146	C: 7/1 to 9/30
1919	Reed-Kaper	90	5/16 to 10/10
1921	Level Meadows	701	5/15 to 9/30
1922	P Heart Individual	146	9/1 to 9/30
1926	McKinney Individual	235	5/1 to 9/30
1934	Red Canyon Rim	Exchange of use[2/]	6/5 to 10/31
1941	McKinney		No lease
2007	Rigby Pasture	176	5/1 to 9/30
2011	Highway	296	4/1 to 5/15
2019	Cooper Creek	240	C: 10/1 to 6/15
			H: 3/1 to 2/28
2026	Little Camp Creek	294	5/1 to 10/31

1/ C=cattle, S=sheep, and H=horses. (Season of use shown are for cattle, unless otherwise noted.)

2/ Privately owned AUMs are exchanged for an equal amount of federally owned AUMs.

TABLE 1-5

HIGH PRIORITY CATEGORY I ALLOTMENTS

Allotment Number	Allotment Name	AUMs	Season of Use[1/]
1412	Poston Complex	437	12/1 to 4/30
1415	Crofts Individual		No lease
1622	Lankin Creek	248	11/15 to 4/30
1701	Flagg AMP	1,980	5/1 to 10/31
1703	Big Pasture	13,238	C: 5/1 to 11/15
		884	S: 6/14 to 10/31
1705	Myers Fenced Pasture	210	C: 4/3 to 11/15
			H: 4/1 to 12/15
1802	Bringolf AMP	1,163	6/1 to 10/15
1803	Government Draw	9,838	5/1 to 10/31
1804	Government Draw-Lower Beaver	5,050	C: 10/1 to 6/10
			S: 10/21 to 5/31
1905	Ellis-Upper Beaver AMP	530	5/16 to 9/30
1908	Slingerland AMP	2,215	5/10 to 10/31
1909	Lee's Onion Flat	188	5/1 to 5/31
1915	Beaver AMP	2,057	5/1 to 10/31
1916	Hall Creek	2,328	5/10 to 11/22
1917	Mazet's Onion Flat	890	C: 4/10 to 6/30
		646	S: 10/1 to 10/30
2003	Whiskey Peak	3,667	C: 5/15 to 11/30
		893	S: 2/5 to 12/2
			S: 6/1 to 12/2
2006	46 Pasture	488	5/1 to 10/31
2013	Fenced	1,727	5/1 to 11/15
2018	Alma Grieve Pasture	480	7/16 to 9/30
2021	Willow Creek	15	1/1 to 1/31

[1/] C=cattle, S=sheep, and H=horses. (Seasons of use shown are for cattle, unless otherwise noted.)

TABLE 1-6

MODERATE PRIORITY CATEGORY I ALLOTMENTS

Allotment Number	Allotment Name	AUMs	Season of Use[1/]
1409	Muskrat Open	10,520	5/1 to 11/30
1413	Pipeline Pasture	452	12/1 to 4/30
1635	Big Rock Pasture	1,995	C: 9/1 to 12/31 H: 3/1 to 2/28
1707	Ice Slough	183	C: 10/1 to 12/30 H: 3/1 to 5/1
1708	Long Creek Outside	111	5/1 to 9/30
1709	Long Creek Pastures	427	4/1 to 12/15
1713	Whitlock Fenced	126	4/1 to 4/30
1801	East Beaver Common	503	C: 5/1 to 11/30
		8,321	S: 11/25 to 4/10 S: 11/10 to 12/31
1805	Kirby-Reservation Boundary	734	5/1 to 10/15
1811	Lander Valley	474	5/11 to 10/31
1901	Atlantic City Common	4,833	C: 5/16 to 9/30 S: 7/14 to 9/16
1903	Silver Creek Common	3,469	5/1 to 10/31
1904	Devils Canyon AMP	652	5/16 to 9/30
1906	Twin Creek Individual	1,644	5/1 to 11/30
1907	Commissary Hill	74	6/1 to 9/30
1920	Salisbury AMP	996	5/16 to 9/30
2001	Green Mountain Common	35,992	C: 5/1 to 12/31
		11,348	S: 3/1 to 11/30
2004	Green Mountain Fenced	651	5/15 to 4/30
2005	Home, South of Highway	383	5/1 to 9/30
2015	Hadsell Pasture	547	5/25 to 10/31
2205	Hopkins 13	40	6/1 to 9/30
2206	Krone 17	45	5/1 to 9/15
2207	Steers 19	265	6/1 to 9/30
2210	Holy Cross 10	274	5/15 to 10/15
2211	Strube 26	258	6/1 to 8/31
2213	Spriggs 36	340	5/15 to 9/30
2214	Double A 37	233	6/1 to 9/30
2215	Wunder 38	220	7/1 to 9/15
2217	Nicholas 40	48	6/1 to 9/30
2218	Double A 41	38	6/1 to 6/30
2219	Slingerland 43	124	5/15 to 10/1
2220	North Fork Land & Development	259	4/1 to 10/31
2228	Spriggs 57	24	C: 5/1 to 6/30 H: 8/1 to 9/30
2232	Hancock 63	152	6/1 to 10/31
2236	Hart 70	24	5/1 to 9/25
2240	Harvey Basin	183	5/15 to 10/30

[1/] C=cattle, H=horses, and S=sheep. (Seasons of use shown are for cattle, unless otherwise noted.)

TABLE 1-7

LOW PRIORITY CATEGORY I ALLOTMENTS

Allotment Number	Allotment Name	AUMs	Season of Use
2209	Weed Draw		No lease
2222	Strube	25	5/1 to 7/1
2223	Ross 51	17	6/1 to 8/31
2225	Crump 53	27	S: 5/1 to 6/30
2235	Horny Toad	35	6/1 to 10/30
2239	Cyclone Pass		No lease

1/ S=sheep. (Season of use shown are for cattle, unless otherwise noted.)

TABLE 1-8

TOTAL FORAGE SUPPLY FOR CATEGORY I ALLOTMENTS AND DEMAND UNDER THE PROPOSED ACTION AND ALTERNATIVES
[In pounds of air dry forage]

Grazing Animals	Forage Supply	Forage Demand 1/				
		Proposed Action	Elimination of Livestock Grazing	Enhanced Livestock Grazing	No Action	Management Based on Currently Available Forage Data
Livestock	115,309,847	165,380,327	0	165,380,327	165,380,327	114,632,708
Wild horses	15,214,230	15,214,200	15,214,200	15,214,200	15,214,200	4,839,660
Wildlife	2/ 20,002,770	20,921,255	20,921,255	20,921,255	20,921,255	20,698,863

1/ These figures show what demand would be when the Proposed Action or alternative was first put into effect. With passing time, the effects of implementing the Proposed Action or alternative would probably cause these figures to change.

2/ This figure cannot be used to determine the total numbers of wild herbivores that could be supported in the EIS area. Instead, limiting factors such as condition and availability of forage on crucial winter ranges determine the total number. Much of the forage shown is available only during the summer months. In addition, most of this forage is big sagebrush, and wild herbivores cannot survive on a straight diet of this browse plant.

in arriving at the recommendations are identified in the analysis in the MFP.

Management Actions for Category M Allotments

Category M allotments compose 20 percent of the allotments and 6 percent of the acreage in the EIS area. For Category M allotments, the principal objective is to maintain or improve the presently satisfactory resource condition and allotment management. It is recommended in the Green Mountain MFP that the management actions for these allotments would be:

1. Authorize the current livestock use under a 10-year permit.
2. When appropriate, authorize increases in livestock use that are consistent with multiple-use objectives.
3. Consult with permittees to develop flexibility in livestock operations.
4. Authorize and construct range improvements to meet management objectives.
5. Monitor range condition, trend, and productivity to ensure that conditions remain satisfactory.

Management Actions for Category C Allotments

Category C allotments compose 26 percent of the allotments and 1 percent of the acreage in the EIS area. For Category C allotments, the principal short-term objective is to prevent deterioration of current resource conditions by managing the lands in a custodial manner. In the Green Mountain MFP, it is recommended that the management actions for these allotments would be:

1. Permit as currently authorized or exclude livestock use.
2. If it becomes apparent that range resource conditions are deteriorating, adjust numbers of livestock and seasons of use or change the allotment to a Category I allotment.
3. Redesignate or eliminate Category C allotments by: changing fence locations, negotiating land exchanges to form blocks of public land, or public sale of the land.

Management Actions for Category I Allotments

Category I allotments compose 54 percent of the allotments and 93 percent of the acreage in the EIS area. The principal objective for management of Category I allotments is to improve existing resource conditions and reduce or eliminate resource conflicts. Specific management actions proposed for Category I allotments depend on the categorization factors affecting each individual allotment (as shown in Table 1-3). Appendix 3 shows the general types of range management actions that could be implemented in Category I allotments to correct the problems identified in the categorization process.

Factors 1, 2, and 3. It is recommended in the Green Mountain MFP that the management actions for allotments where these factors apply would be:

1. Adjust stocking levels of grazing animals to the degree monitoring indicates is necessary. (For livestock, this may range from elimination of livestock grazing to increases in livestock. For wild horses, increases or decreases may be made within the limits of maintaining viable herds. For wildlife, increases or decreases may be made after consultation with the Wyoming Game and Fish Department.)
2. Monitor climate and range condition, trend, utilization, and actual use.

Factor 4. It is recommended in the Green Mountain MFP that the management actions for allotments where this factor applies would be:

1. Develop water resources in allotments where distribution problems are caused by lack of water.
2. Use grazing systems and/or fencing to solve problems in allotments where livestock are concentrating on riparian areas. Fenced off riparian zones should include the entire meadow area.
3. Exclude livestock from crucial wildlife areas.

Factor 5. It is recommended in the Green Mountain MFP that the management actions for allotments where this factor applies would be:

1. Conduct monitoring studies to determine plant phenology and range readiness. Major grass species used to determine range readiness are shown in Table 1-9, and the three range readiness areas in the EIS area are shown on Map 1-3.
2. Adjust turnout dates and/or seasons of use based on range readiness.

Factor 6. It is recommended in the Green Mountain MFP that the management actions for allotments where this factor applies would be:

1. Conduct annual monitoring to determine the amount of surface disturbance and resulting loss of forage production.
2. Rehabilitate areas where surface disturbance is causing loss of forage production.

TABLE 1-9

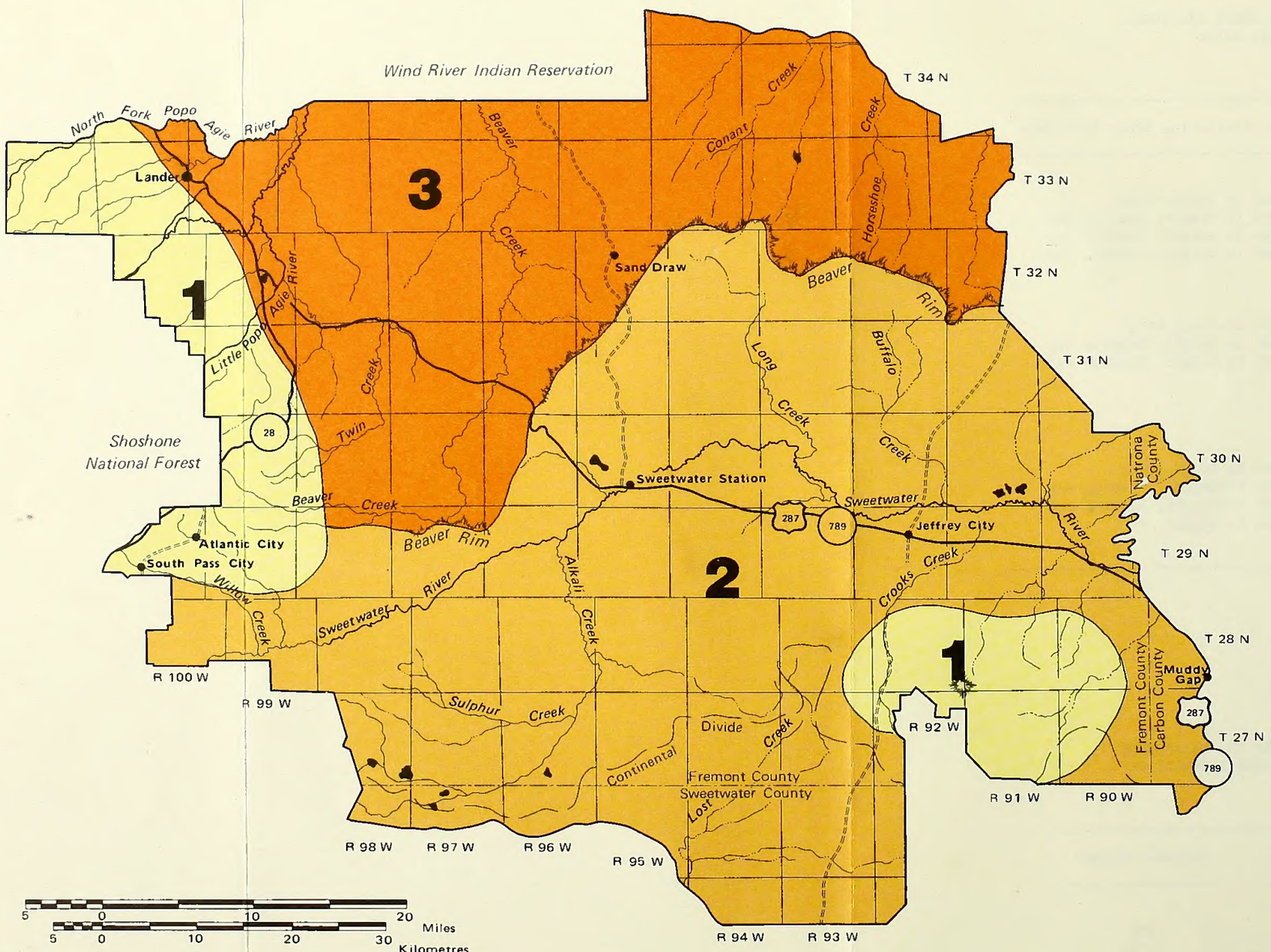
MAJOR GRASS SPECIES USED TO DETERMINE RANGE READINESS
WITHIN THE THREE RANGE READINESS AREAS

	Species	Stage of Development Indicating Range Readiness
Area 1	Blue grass	Plants maturing, seed in dough stage
	Idaho fescue	4 to 6 inches or more in height, heading out
	Bluebunch wheatgrass	4 to 8 inches or more in height, heading out
	Needlegrass	4 to 6 inches or more in height, heading out
Area 2	Sandberg bluegrass	Plants maturing, seed in dough stage
	Bluebunch wheatgrass	4 to 8 inches or more in height, heading out
	Idaho fescue	4 to 6 inches or more in height, heading out
	Sedge	Seed formed
	Prairie junegrass	Heading out
Area 3	Sedge	Seed formed
	Sandberg bluegrass	Plants maturing, seed in dough stage
	Needlegrass	4 to 6 inches or more in height, heading out
	Thickspike	4 to 8 inches or more in height, heading out
	Western wheatgrass	4 to 8 inches or more in height
	Blue grama	Seed formed

TABLE 1-10

ADJUSTMENTS IN WILD HORSE NUMBERS UNDER THE MANAGEMENT
BASED ON CURRENTLY AVAILABLE FORAGE DATA ALTERNATIVE

Herd Area	Present Inventory	Proposed Number
Muskrat Basin	460	150
East Beaver Creek	120	0
Rock Creek Mountain	132	40
Conant Creek	71	40
Dishpan Butte	87	40
Crooks Mountain	168	50
Antelope Hills	166	57
Green Mountain	219	70
Totals	1,423	447



Map 1-3
RANGE READINESS AREAS
Green Mountain Grazing
Environmental Impact Statement

3. Make temporary or permanent adjustments in stocking levels of grazing animals as necessary to promote rehabilitation.
4. Where damage is occurring from off-road vehicles (ORVs), exclude their use, temporarily or permanently.
5. Use temporary or long-term fencing to exclude livestock grazing in areas where major conflicts with other land uses occur.

Factors 7, 8, and 9. These factors apply to all Category I allotments. In the Green Mountain MFP, there are no specific management actions recommended for dealing with these factors. However, positive economic return would be a major consideration in all management actions involving public investments.

Elimination of Livestock Grazing

Under this alternative, after permits expire in 1989 livestock grazing would be eliminated from the public lands in the Green Mountain EIS area, and the lands would be managed for other resource values. Domestic livestock would not be able to use the 166,093 AUMs of forage currently allocated for their use. Trailing of livestock would be allowed across BLM-administered lands to National forest, private, and state lands, but there would probably be a very minimal amount of trailing.

Since wildlife and wild horse populations would not have to compete with livestock for forage, there would be more than enough to satisfy the present wildlife and wild horse population levels. Wild horse populations would be allowed to increase to approximately 6,000 head, provided this did not cause damage to or conflicts with other resources. (Wild horse numbers would be reduced from any level at which such damage or conflicts occurred.) Wildlife populations would be held at the levels set in the Wyoming Game and Fish Department's strategic plan. (The mule deer population is below the numbers set in the strategic plan and would be allowed to increase to plan levels.)

Only those range improvements necessary for wildlife or wild horses (as shown in the Moneta Planning Unit URA-3 and the Sweetwater Planning Unit URA-3) would be maintained. Some fences might be removed if they interfered with wildlife and wild horse movements. Additional fencing might be necessary on nonpublic lands if operators could not control livestock movement from their leased state and private lands onto public lands. This additional fencing would be paid for by the operators. Unauthorized use of public land (trespass) by livestock would be dealt with in accordance with standard BLM procedures, as shown in Section 9230 of the BLM Manual.

Enhanced Livestock Grazing

Under this alternative, livestock would have priority in forage allocation. Forage available for domestic livestock use would be increased through accelerated program of management activities. Potential range management actions under this alternative are shown for the Category I allotments in Appendix 4. Suitable allotments would be placed under AMPs. If wildlife numbers needed to be reduced, the actual figures would be negotiated with the Wyoming Game and Fish Department. Wild horse numbers would not be allowed to increase from their present levels.

No Action

Under this alternative, the existing range management program would be frozen. AMPs in effect (allotments 1701, 1802, 1904, 1908, 1911, 1915, and 1920) would continue, but no new AMPs would be developed. There would be no new range improvement projects. Maintenance of existing improvements (shown in the Moneta Planning Unit URA-3 and the Sweetwater Planning Unit URA-3) would be allowed. Changes in AUMs, seasons of use, or class of livestock from the present situation (as shown in Appendix 1 and Tables 1-1, 1-2, 1-4, 1-5, 1-6, and 1-7) would not be allowed, regardless of need. Wild horse numbers would be held at present levels, through roundups if necessary.

Freezing the present use of vegetation would allow BLM and the public to look at the consequences of continuing the existing rangeland uses in the Green Mountain EIS area. However, new federal legislation, such as amending the Taylor Grazing Act, would be required to apply this alternative to the entire EIS area.

Management Based on Currently Available Forage Data

Under this alternative, currently available forage data (as shown in Appendix 2), instead of monitoring, would be used to set initial grazing capacities. Therefore, plans for adjustments in livestock, wildlife, and wild horse numbers would be made more rapidly than for the Proposed Action. Monitoring, as described for the Proposed Action, would then be used to determine whether other adjustments were necessary.

Based on the forage data, public input, and observations by people who are knowledgeable about the wild horse herd areas (shown on Map 1-4), wild horse numbers would be adjusted as shown in Table 1-10. Wild horses would be allowed to remain only in the areas in which they were found at the time the Wild Free-Roaming Horse and Burro Act of 1971 (Public Law 92-195) was passed. Adjustments in wildlife numbers in each allotment would be based on the forage data and the Wyoming Game and Fish Department strategic plan for the area. The remaining estimated forage would then be available for livestock use, and adjustments in livestock numbers would be made accordingly. Requests for changes from cattle to sheep would be approved.

Other management actions, such as construction and maintenance of range improvements, would be the same as described for the Proposed Action. The schedule for issuing grazing decisions would be approximately the same as shown in Figure S-1 in the Summary section of this EIS.

INTERRELATIONSHIPS WITH OTHER PROGRAMS

BLM's programs and proposals are closely related to those of other agencies and individuals. Interrelationships are discussed below.

U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) has been given initial responsibility for implementing Section 208 of the Federal Water Pollution Control Act Amendment of 1972. Under this act and Executive Order 12088, BLM is required to control water pollution that originates from large areas of public land. EPA is working through area-wide water quality management agencies and local Soil Conservation Service offices to complete plans for controlling water pollution in problem areas. Once the requirements of these plans are finalized, BLM will take the measures necessary to comply with them.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service conducts predator control in the Lander Resource Area under joint agreement with BLM and the Wyoming Game and Fish Department. The control consists of aerial shooting and limited trapping of coyotes, mostly during the fall, winter, and early spring. No chemical toxicants are used. The U.S. Fish and Wildlife Service is also the consulting agency under the Endangered Species Act of 1973 and has responsibility for migratory birds.

U.S. Soil Conservation Service

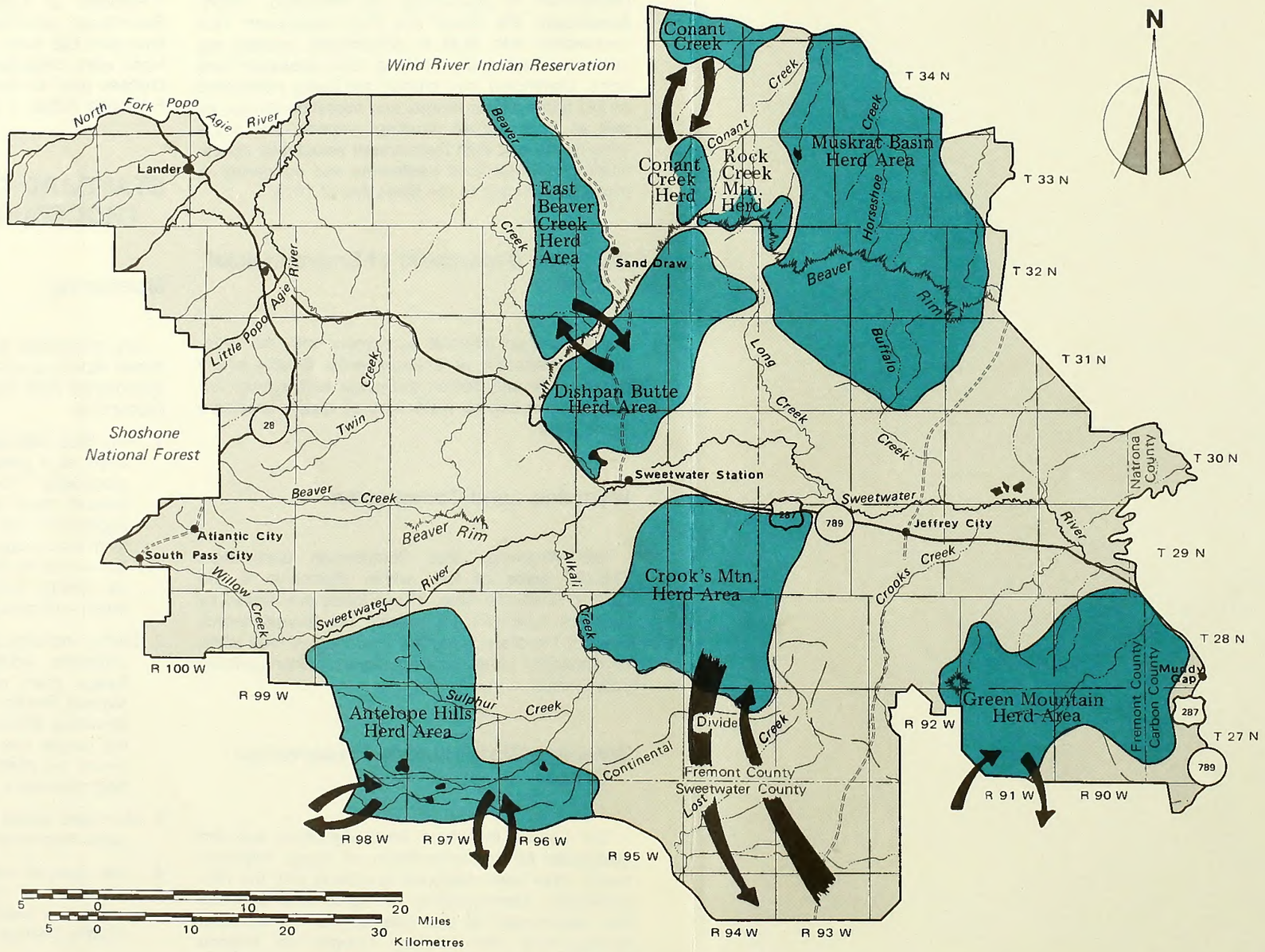
The U.S. Soil Conservation Service (SCS) is involved with permittees and the Wyoming Department of Lands in preparing cooperative or integrated ranch plans. SCS may become more involved in allotments that include significant portions of private and state land. This may be particularly true in Category M and Category C allotments, where BLM will be spending less effort in plan preparation.

U.S. Forest Service

Some of the livestock operators on BLM lands also hold U.S. Forest Service permits. Changes in seasons on either BLM or U.S. Forest Service lands often create a demand for change on the other agency's lands. Much of the wildlife use also occurs on U.S. Forest Service and BLM lands, and cooperation between the two agencies and the Wyoming Game and Fish Department is ongoing. The U.S. Forest Service was consulted in development of the Green Mountain MFP and will continue to be included in the decisionmaking process for specific operations.

Wyoming Game and Fish Department

The Wyoming Game and Fish Department has established goals and objectives for wildlife management on public lands within the Green Mountain EIS area. Because wildlife habitat would be affect-



Wild Horse Concentration Areas

Movement Patterns

Map 1-4
WILD HORSE HERD AREAS
Green Mountain Grazing
Environmental Impact Statement

ed by the proposed grazing management (especially the stocking rates), there has been coordination between BLM and the Wyoming Game and Fish Department in developing the Proposed Action. Specifically, the Game and Fish Department has cooperated with BLM in determining existing big game numbers and projecting 1990 desirable herd sizes. Continuing joint studies are being conducted on big game winter ranges and migration routes, as well as sage grouse strutting grounds. The Wyoming Game and Fish Department would also review all proposals for land treatments and cooperate in projects, pursuant to the Sikes Act of 1974.

Wyoming Department of Environmental Quality

BLM has an informal agreement with the Wyoming Department of Environmental Quality which provides for information exchange and agency coordination in solving water and air quality problems in the state.

Wyoming Land Commission

The Wyoming Land Commission administers 110,483 acres of land within allotments in the Lander Resource Area. These lands are leased by livestock operators for grazing on 10-year terms. Most of the state lands are intermingled with BLM-administered lands, making separate management impractical.

Wyoming State Historic Preservation Officer

The Lander Resource Area objectives and the guidelines for implementation of range improvements have been designed to comply with the Programmatic Memorandum of Agreement between the Department of the Interior, Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers regarding the Livestock Grazing and Range Improvement Program. A copy of every cultural resources inventory report is submitted to the Wyoming State Historic Preservation Officer.

County Planning Commissions

Portions of Carbon, Fremont, Natrona, and Sweetwater counties are included in the Green Mountain EIS Area. The county planning commissions were consulted during the land use planning process prior to development of this EIS, and the Proposed Action is compatible with their concerns.

STANDARD OPERATING PROCEDURES

Monitoring

Any monitoring that would occur under the Proposed Action or alternatives would be conducted in accordance with the following standard operating procedures:

1. The BLM Manual, Section 4430.56, would be used as a general guide in developing trend-monitoring procedures. Plant frequency and ground cover would be sampled to evaluate vegetation and soil trend. Other parameters, such as canopy, seedling, or shrub characteristics would be considered on unique areas such as riparian zones, aspen stands, and bitterbrush and mahogany thickets.
2. During and after grazing of each pasture, forage utilization would be measured by the key forage plant method described in the BLM Manual, Section 4430.47. This would aid in determining whether stocking levels were providing proper use and what adjustments, if any, would be needed. These studies would also help determine a schedule for seasonal use.
3. Meadows would be monitored to determine impacts from livestock grazing activities.
4. Rain gauges would be used to take measurements of precipitation to help interpret vegetation production variations resulting from climatic changes.
5. Water quality and quantity would be monitored as necessary to determine problem areas.
6. Soil movement would be assessed in conjunction with trend and utilization studies. Changes in gully development along transects would be documented. Clay-mineral analysis of sediment would be used to monitor changes in sediment and erosion sources.

Grazing Administration

Any grazing administration that would occur under the Proposed Action or alternatives would be conducted in accordance with the following standard operating procedures:

1. Permits specifying the season of use and number and kind of livestock would be issued to each operator. Operators would have to obtain BLM approval prior to changing the grazing specifications outlined in their permits.
2. Livestock operators would file actual-use reports showing how many and how long cattle grazed in each pasture. Use on the allotments would be supervised by BLM throughout the grazing year.
3. Trespass actions would be initiated for any allotment grazed outside the limits described in the permit. The trespass would be eliminated and payment retrieved from those responsible for damage and consumption of forage.
4. Each AMP would incorporate site-specific objectives for maintaining or improving wildlife and fish habitat within the allotment. The grazing system implemented under the AMP would be designed to achieve those objectives.

Range Improvements

Any range improvements that would occur under the Proposed Action or alternatives would be conducted in accordance with the following standard operating procedures.

General

1. Before construction of range developments and vegetative manipulations, cultural resources would be inventoried and evaluated, and attempts to avoid sites of significant cultural resources and high site density areas would be made. If this was not possible, consultation would be made with the State Historic Preservation Officer and the Advisory Council on Historic Preservation to develop acceptable mitigative strategies. Locations of cultural sites would not be disclosed to the public.
2. Site-specific endangered species inventories would be completed before any project was implemented. Endangered Species Act, Section 7 consultations would be conducted, if deemed necessary.
3. New range developments and maintenance of existing developments within Wilderness Study Areas would be consistent with the BLM's Interim Management Policy and Guidelines for Land Under Wilderness Review.
4. In accordance with the BLM Manual, Section 8341, visual resource management contrast ratings would be used in the project planning stages of all proposed land management activities that would disturb the soil, change or remove vegetation, or place a structure on the landscape. These ratings would be used to determine the amount of contrast between a proposed activity and the existing landscape. Assessing the amount of contrast would indicate the severity of impact and serve as a guide in determining what would be required to reduce the contrast (visual impact) to the point where it would meet the visual management class requirements for the area where the project would be located.
5. Cooperative agreements with range users would outline maintenance responsibilities for range improvement projects.

Fences

1. Fences would be installed according to spacing, height, and other specifications described in the BLM Manual, Section 1737.
2. No more than 0.5 acres per mile would be disturbed during fence construction, and fence lines would not be bladed or scraped.
3. Construction of fences in wildlife use areas would meet BLM specifications to permit the movement of identified wildlife species, and pole-top fence would be used to avoid injury to elk.
4. Cattleguards, instead of gates, would be located where fences cross roads. Generally, cattleguards would be 8-feet wide and 12-feet long.

Water Developments

1. Livestock watering developments would be available and safe for identified wildlife and wild horse needs.
2. After the excavation of a spring, a metal headbox would be installed. The water would be piped into a trough with an overflow pipe leading back into the original drainage or into a new pit. The meadow complex around the spring would be fenced.

3. All water troughs would be either 18-foot circular rings with concrete bases or 3-foot x 12-foot metal troughs. Wildlife escape ramps would be installed to prevent birds and small animals from drowning.
4. Windmills would be drilled and cased, the pump facilities placed, and if desired, a storage tank installed. No more than 0.05 acres per windmill would be disturbed.
5. After excavation of a reservoir, the dike, which would contain a spillway, would be placed. Reservoirs would have an average capacity of 1 acre foot.

Land Treatments

1. Brush control would be done by applying herbicides from aircraft or by burning. Noxious weeds would be controlled by herbicide application or burning. Chemicals would be cleared by the U.S. Department of the Interior. Burning plans would be cleared by the Wyoming Department of Environmental Quality. A 100-foot buffer on live streams and other water sources would be observed for aerial application of treatments, and setbacks from water and timber would be required when chemicals were applied. Aerial spraying would be done when wind speed was less than 6 miles per hour.
2. After treatment, the land would be seeded (drill or broadcast) with the desired forage species and grazing would be deferred until the seedlings were sufficiently established. Water bars would be used to control erosion.
3. To prevent erosion, land treatments would not be done on slopes greater than 15 percent.
4. Wildlife habitat needs would be considered for all land treatments. No treatment would be done within ¼ mile of identified sage grouse strutting grounds, and treatments would be restricted in crucial habitat areas.
5. Reclamation of areas disturbed by energy and mineral activities would involve seeding or planting native shrubs to restore wildlife habitat.

CHAPTER 2

AFFECTED ENVIRONMENT

INTRODUCTION

In order to provide basic background information, four aspects of the existing environment that would not be affected by the Proposed Action or any of the alternatives are discussed in this chapter. These are topography, climate, forestry, land use, and land use plans. In addition, the following items were analyzed to determine if the Proposed Action or any of the alternatives would have an impact on them:

1. Flood plains, wetlands, and prime or unique farmlands.
2. Wilderness values.
3. Areas of Critical Environmental Concern (ACECs).
4. Water quality, for prime or sole sources of drinking water.
5. Air quality.
6. Wild or scenic rivers (designated or recommended).

The analysis revealed that none of these items would be affected by the Proposed Action or any of the alternatives. Therefore, these items will not be described in this chapter.

TOPOGRAPHY

The topography of the Green Mountain EIS area varies from level terrain to steep mountains. Elevations range from a high of 10,360 feet to a low of 5,090 feet. Major topographic features in the study area include:

1. The Wind River Range, a large, northwest trending range, located along the western boundary of the study area. It is characterized by steep, rocky terrain.
2. The Green Mountains, an extension of the Wind River Range, located in the southeastern portion of the study area. They consist of a moderately large, relatively complex, west-northwest/east-southeast trending range, characterized by steep, rocky terrain.
3. Beaver Rim, a large topographic and hydrologic divide separating the Wind River and Sweetwater watersheds. It is characterized by a highly variable slope gradient.
4. The Blue Ridge/Cedar Ridge area, part of a moderately large, breached anticline, is located approximately 12 miles southeast of Lander. It is asymetrical in form, with a very gentle, nearly level, western arm and a very steep eastern arm.

CLIMATE

The general climatological conditions in the Green Mountain EIS area are typical of continental high plains; i.e., cool summers with short growing seasons and little precipitation, followed by cold winters with frequent blizzards. Topographical features cause regional variations in all climatological factors.

The predominant air movement is from the west. Westerly winds are strongest during the winter months. During the summer, as the influence of the westerly winds decreases, moist air from the Gulf of Mexico invades the area. Average annual wind speed in the area is 10-15 mph.

The semiarid conditions in the area are largely due to the Wind River Mountains, which block moisture-laden air originating at the Pacific coast from entering the area. Winter months are usually the driest, with most precipitation falling as snow. April and May are the wettest months. Precipitation decreases through the summer and increases in September and October. Average annual precipitation in the area is 11.7 inches. Average annual humidity for the area is 45-55 percent.

Maximum temperatures average between 80 and 90°F and usually occur in July and August. Minimum temperatures average between −20 and −30°F and usually occur in January and February. The yearlong average temperature in the area is 42°F.

Growing seasons in the EIS area vary greatly due to topographical influences. The average frost-free growing season at Lander is 126 days.

LAND USE

Land in the Green Mountain EIS area is primarily used for livestock grazing, wildlife habitat, mineral exploration and production, and recreation. Activities of lesser importance include timber harvesting in the Green Mountains and the use of the public lands under rights-of-way for transportation, communications, and utility systems.

LAND USE PLANS

The majority of the Green Mountain EIS area is within the area covered by the Land Use Plan for Fremont County, Wyoming (Grieve et al., 1978). Land Use Plan goals pertaining to the EIS are: to conduct planned, orderly urban growth; to provide adequate land area for additional housing units; to protect and preserve agriculturally productive land for continued agricultural purposes; to protect or improve the existing quality of air, water, and land resources; to provide for the wise use and conservation of natural resources; and to preserve, protect, and enhance existing scenic areas and historic sites.

SOILS

Soils in the Green Mountain EIS area are highly developed with generally low erosion rates. This was determined by soil surveys conducted in the area. Soils maps showing location and extent of each type of soil and soil survey reports describing these soils are available for review at the BLM Rawlins District Office.

Soil is being removed from the EIS area, in the form of sediment, through sheet and rill erosion. The sediment is deposited in stream channels and lake basins downstream. The rate of deposition (sediment yield) ranges from 0.37 to 2.57 tons per acre per year (as calculated from information in the BLM Manual, Sections 7317 and 7322). The average rate of sediment yield for the EIS area is approximately 0.90 tons per acre per year (as determined by the methodology described in Appendix 5). According to the rating system in the BLM Manual, Section 7317, sediment yield in the EIS area is slight.

The method described in Appendix 5 is used to measure sediment accumulation and movement into stream channels and reservoirs. Total soil displacement on uplands exceeds the quantity entering streams, and is not completely measured by this method. Thus, the sediment yield data are minimum estimates of soil displacement and loss.

The level of wind erosion may exceed the level of water erosion in areas where climatic and physical features are more conducive to wind erosion. However, impacts from wind erosion as a separate process cannot be quantified due to lack of data for the EIS area.

There are 18 major soil associations in the EIS area. Map 2-1 is a general soils map showing the locations of the different soil types. Soil unit descriptions, erosion potential guidelines, wind erodibility soil groupings, and wind erodibility group ratings for general soils map units are contained in Appendix 6.

HYDROLOGY

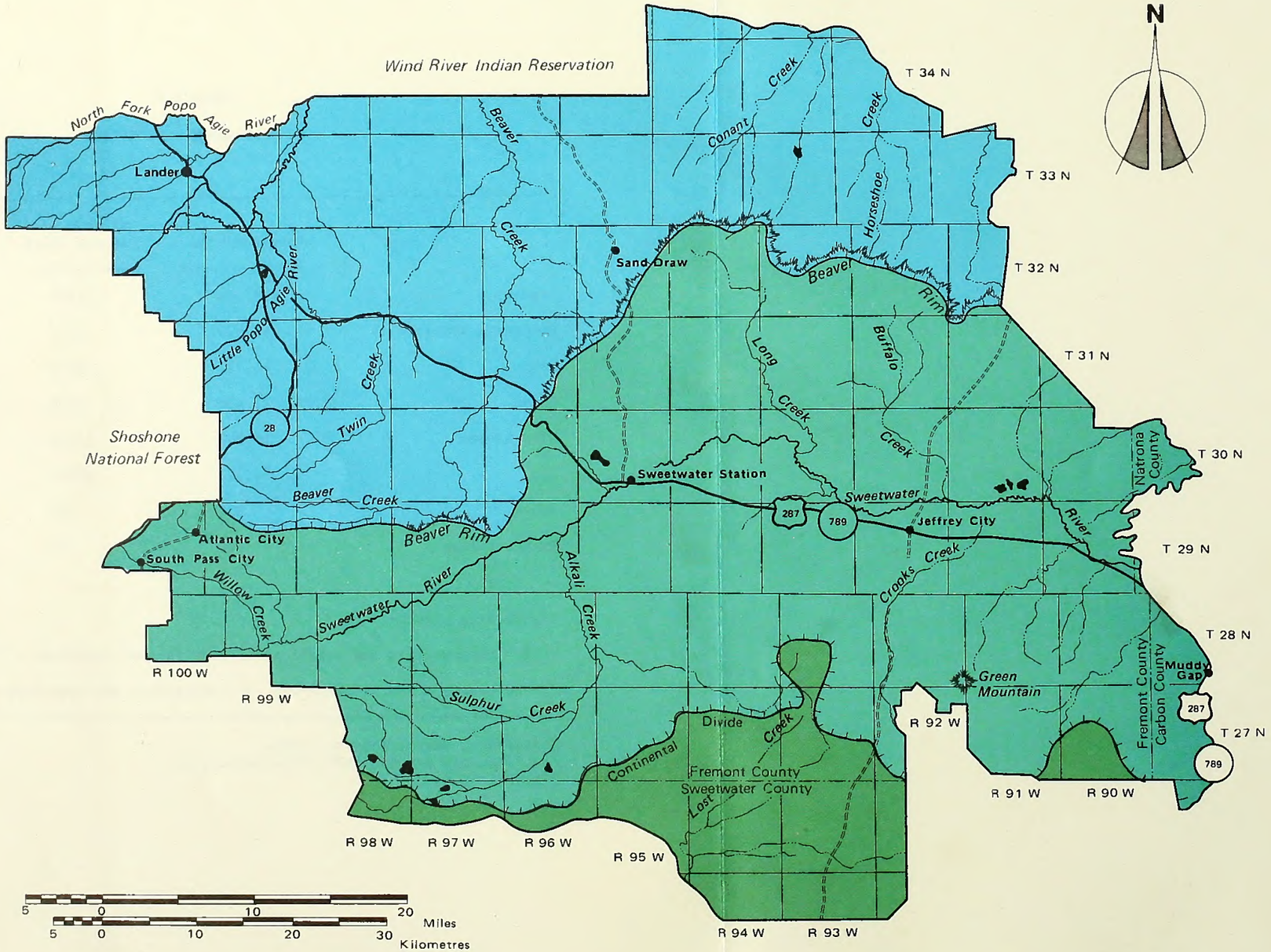
Water Resources

The Green Mountain EIS area is affected by three principal drainages: Sweetwater River, Wind River, and the Great Divide Basin. These drainages are shown on Map 2-2. The Sweetwater River drains approximately 53 percent of the area; the Wind River, 39 percent; and the Great Divide Basin, 8 percent. The Sweetwater River is tributary to the North Platte River, the Wind River is tributary to the Bighorn River, and the Great Divide Basin is a topographically closed basin.

Water Quantity

There are numerous streams, over 300 reservoirs, and over 100 wells and springs in the EIS area. Sweetwater River, Little Popo Agie River, Middle Popo Agie River, Twin Creek, Beaver Creek, Crooks Creek, Cottonwood Creek, and Rock Creek are the major perennial streams and are fed primarily by snowmelt in the mountains. Because the EIS area is predominantly semiarid plains with intermittent streams, runoff from public lands in the EIS area contributes little water to these major streams.

Water yield data for the entire EIS area are not available. Reservoir losses from livestock consumption are negligible, since water losses from evaporation far exceed the projected volume consumed by livestock and wildlife (Table 2-1).



Wind River Drainage

Sweetwater River Drainage

Great Divide Basin Drainage

Map 2-2
PRINCIPAL DRAINAGE
Green Mountain Grazing
Environmental Impact Statement

TABLE 2-1

PRESENT WATER CONSUMPTION

	Animal Months	Gallons per Animal Month	Acre-Feet per Year
Cattle	159,048	1/ 300	146.4
Pronghorn antelope	47,800	1/ 12	1.8
Deer	46,977	1/ 12	1.7
Sheep	21,410	1/ 30	2.0
Wild horses	16,260	1/ 300	15.0
Elk	14,723	2/ 120	5.4
Moose	836	120	0.3
Bighorn sheep	806	30	0.1
Total			172.7

Evaporative Losses 3/:

300 reservoirs x 5.5 acre-feet of capacity per reservoir = 1,650 acre-feet

300 reservoirs x 5.4 acre-feet of evaporation per reservoir = 1,620 acre-feet

1/ Stoddart, Smith, and Box, 1975.
2/ BLM Manual, Section 1605, Illustration 12.
3/ Smith, 1974.

Water Quality

Table 2-2 shows recommended federal water quality standards for drinking water and Wyoming surface water effluent limitations. These standards may be compared to the following water quality data from the EIS area.

Surface Water

Perennial streams in the EIS area are generally of good quality. Table 2-3 shows the water quality of the Sweetwater River, the major drainage in the EIS area. The levels of dissolved chemicals (chlorides, sulfates, carbonates, and nitrates) typically increase in dry years and decrease in wet years. Suspended sediment concentrations are highest in wet years (e.g., water year 1974-75). Nutrient levels in the Sweetwater River are low (0 to .34 milligrams per liter of nitrates and 0 to .08 milligrams per liter of total phosphorous). In most cases, the quality of the water is within the standards shown in Table 2-2, above.

The main impacts on water quality caused by livestock grazing are from sedimentation and fecal coliform. Fecal coliform is below drinking water quality standards in all samples taken from the EIS area. Total dissolved solids (TDS) are a measure of sedimentation from runoff into surface waters. TDS (synonomous with salinity) varies in the EIS area; however, most samples taken reflect a level of TDS within federal standards. The amount of TDS a stream contains is highly dependent on:

1. Grazing practices. Overgrazing may increase both suspended sediment levels and TDS.
2. Distance downstream, in all perennial streams in the EIS area.
3. Saline soils and high evaporation rates, as stream elevations decrease in lower portions of stream basins.

Major perennial streams in the EIS area are usually within the recommended federal drinking water standard of 500 milligrams per liter TDS. However, many intermittent streams, such as East Alkali Creek and West Alkali Creek, have very high TDS concentrations. East Alkali Creek had a TDS concentration of 4,187 milligrams per liter during May 1977, and West Alkali Creek had a TDS concentration of approximately 1,468 milligrams per liter during the same month. TDS above 3,000 milligrams per liter may be hazardous to wildlife and livestock (Office of Water Planning and Standards, 1975).

Suspended sediment is the most serious surface water pollutant in the EIS area. Sediment yield is highest in the EIS area during spring and summer, when runoff occurs in direct response to snowmelt in spring and rainfall in summer. Annual sediment yield is approximately 600 tons per square mile and is attributable primarily to the sparse vegetative cover, which cannot adequately protect the soil from the effects of runoff. (See the Vegetation section in this chapter.)

The Green Mountains are especially susceptible to erosion. At present, existing roads, road construction, and mining activities yield substantial sediment to Crooks Creek, Willow Creek, and Cottonwood Creek. Erosion is also accelerating in areas where there is heavy grazing or poor distribution of cattle, particularly near streams.

Ground Water

The quality of ground water varies greatly from site to site in the EIS area. Total dissolved solids are quite high (greater than 1,000 milligrams per liter) in some wells. The Hamilton Well (sec. 7, T. 33 N., R. 97 W.) had a TDS concentration of 3,880 milligrams per liter in January 1974, and the well used by the town of Hudson had a TDS of 1,010 milligrams per liter in February 1973. Water quality of most wells in the EIS area is adequate for livestock and wildlife use.

VEGETATION

Types

There are eight major vegetation types in the Green Mountain EIS area: grass, meadow, sagebrush, greasewood/saltbush, mountain shrub, juniper, conifer, and waste. Acreage and percentage figures and subtypes, major plant species, and associated wildlife habitat types for each of these vegetation types are listed in Table 2-4. Distribution of the major vegetation types is shown on Map 2-3 (located in Volume 2 of this EIS), and the major vegetation types are broken down by management category in Table 2-5. This information is based on data from the Green Mountain Weight Estimate Forage Survey.

Grass

The average composition by weight of the grass vegetation type is 48 percent grass species, 10 percent forbs, and 42 percent shrubs. (Grass species range from 30 to 70 percent of the composi-

TABLE 2-2

WATER QUALITY STANDARDS AND EFFLUENT LIMITATIONS
[In milligrams per liter unless otherwise noted]

	Limit	Reason for Limit
Drinking Water Quality Standards[1/]		
Chloride	250	Taste and laxative properties
Nitrate (as N)	10	Methemoglobinemia in infants (blue babies)
Sulfate	250	Taste and laxative properties
Total dissolved solids	500	Taste and laxative properties
Wyoming Effluent Limitations[2/]		
Dissolved oxygen	5 (Class 3 waters) 6 (Class 1 and Class 2 waters)	Maintenance of aquatic life
Coliform	200 colonies per 100 milliters for 30 days	Sanitary quality

[1/] Code of Federal Regulations (CFR) 40, Parts 141 and 143.
[2/] Wyo. Dept. Env. Qual., 1979.

TABLE 2-3

WATER QUALITY OF THE SWEETWATER RIVER AT THE DUMBELL RANCH[1/]
[In milligrams per liter unless otherwise noted]

	Hardness	Total Dissolved Solids	Chlorine	Sulfates	Carbonates	Phosphorous	Nitrates	Dissolved Oxygen	Fecal Coliform[2/]	Suspended Sediment
					Water Year 1974-75					
Discharge (weighted average)	108	192	11.5	34.2	126.8	.034	.065	8.5	51.4	48.5
Range of concentrations	75-200	128-383	6.5-28	19-73	84	0-.08	0-.07	6.4-11.3	22-88	10-92
					Water Year 1976-77					
Discharge (weighted average)	146	283.2	18.5	625	170	.024	.125	10.0	348.3	27.5
Range of concentrations	130-190	227-380	8.6-44	45-100	130-210	0-.07	0-.34	8.8-10.7	2.2-818	4-82

1/ The Sweetwater River at the Dumbell Ranch is the best representative sample area for water quality, because data from the Sweetwater Station, Wyoming, was not available.
2/ Fecal coliform is measured by counting the number of coliform colonies in 100 milliliters of water.

Note: Total water discharge for April-September during Water Years 1974-75 was 95,620 acre-feet. Total water discharge for April-September during Water Year 1976-77 was 23,756 acre-feet. There are no discharge records for October-March.

Source: Geological Survey, 1976, and Geological Survey, 1978.

TABLE 2-4

MAJOR VEGETATION TYPES

Vegetation Type	Acres	Percent of EIS Area	Subtypes	Major Plant Species			Associated Wildlife Habitat Types[1/]
				Grasses/Grasslike	Forbs	Shrubs/Trees	
Grass	44,421	2.9	Short grass	Western wheatgrass Thickspike wheatgrass Bluebunch wheatgrass Needlegrass Sandberg bluegrass Indian ricegrass Blue grama Idaho fescue Prairie junegrass Threadleaf sedge	Phlox Wild buckwheat Pussytoes Aster	Big sagebrush Douglas rabbitbrush	Upland meadow Short grassland Sagebrush-mixed grass steppe
Meadow/Riparian	22,204	1.5	Wet meadow Riparian	Thickspike wheatgrass Quackgrass Kentucky bluegrass Tufted hairgrass Mat muhly Rushes Sedges Alkali cordgrass Inland saltgrass	Thistle Iris Lupine Phlox Horsetail Western yarrow	Rubber rabbitbrush Narrowleaf cottonwood Water birch Dogwood Common chokecherry Currant Juniper Shrubby cinquefoil Willow Big sagebrush Wild rose Aspen	Riparian grassland Willow-waterbirch riparian shrubland Aspen riparian woodland Cottonwood riparian woodland

TABLE 2-4--CONTINUED

MAJOR VEGETATION TYPES

Vegetation Type	Acres	Percent of EIS Area	Subtypes	Major Plant Species			Associated Wildlife Habitat Types[1/]
				Grasses/Grasslike	Forbs	Shrubs/Trees	
Sagebrush	1,298,909	91.0	Big sagebrush Rabbitbrush	Western wheatgrass Thickspike wheatgrass Bluebunch wheatgrass Sandberg bluegrass Indian ricegrass Threadleaf sedge Needlegrass	Phlox Wild buckwheat Lupine Pussytoes Aster Milkvetch Indian paintbrush Plains pricklypear Penstemon Vetch	Basin big sagebrush Black sagebrush Wyoming big sagebrush Douglas rabbitbrush Rubber rabbitbrush Broom snakeweed Silver sagebrush	Greasewood-sagebrush riparian shrubland Big sagebrush-rabbitbrush steppe
Greasewood/ Saltbush	12,232	0.7	Black greasewood Saltbush	Inland saltgrass Alkali sacaton Needlegrass Thickspike wheatgrass Bottlebrush squirreltail Blue grama Sandberg bluegrass	Pursh seepweed Dock Phlox Lomatium Plains pricklypear Pepperweed Globemallow	Black greasewood Big sagebrush Gardner's saltbush Winterfoot Bud sagebrush Douglas rabbitbrush Broom snakeweed Shadscale Birdsfoot sagebrush	Greasewood-sagebrush riparian shrubland Saltbush steppe Greasewood steppe

TABLE 2-4--CONTINUED

MAJOR VEGETATION TYPES

Vegetation Type	Acres	Percent of EIS Area	Subtypes	Major Plant Species			Associated Wildlife Habitat Types[1/]
				Grasses/Grasslike	Forbs	Shrubs/Trees	
Mountain Shrub	8,445	0.5	Bitterbrush Mountain mahogany Other mountain shrubs	Bluebunch wheatgrass Sandberg bluegrass Spike fescue Idaho fescue Mountain brome Threadleaf sedge	Western yarrow Violet Common dandelion Lupine Cinquefoil Arnica Balsamroot	Antelope bitterbrush Snowberry Big sagebrush Skunkbush sumac Rubber rabbitbrush Silver sagebrush Common chokecherry Wild rose Ceanothus	Bitterbrush-sagebrush steppe Mountain shrubland
Juniper	5,758	0.4	Juniper	Western wheatgrass Threadleaf sedge Bluebunch wheatgrass Idaho fescue Indian ricegrass Needlegrass Green needlegrass	Indian paintbrush Larkspur Penstemon Goldenweed	Utah juniper Commmon juniper Big sagebrush Winterfat	Juniper woodland Mountain shrubland

TABLE 2-4--CONTINUED

MAJOR VEGETATION TYPES

Vegetation Type	Acres	Percent of EIS Area	Subtypes	Major Plant Species			Associated Wildlife Habitat Types[1/]
				Grasses/Grasslike	Forbs	Shrubs/Trees	
Conifer	14,475	1.0	Lodgepole pine Limber pine Engelmann spruce Douglas fir Aspen	Bluegrasses Sedges Mountain brome Idaho fescue	Arnica Balsamroot Oregon grape Penstemon Bedstraw Vetch Hawksbeard	Limber pine Lodgepole pine Serviceberry Common chokecherry Quaking aspen Huckleberry Antelope bitterbrush Douglas fir Engelmann spruce	Limber pine woodland Quaking aspen woodland Aspen-conifer woodland Ponderosa pine-Douglas fir forest Highland conifer forest
Waste	25,736	2.0	Rock Barren Steep slope Dense timber				Limber pine woodland Juniper woodland Mountain shrubland

[1/] Adapted from the Standard Habitat Site Classification: Overland EIS Area, September 1981.

TABLE 2-5

MAJOR VEGETATION TYPES BY MANAGEMENT CATEGORY

Management Category	Grass	Meadow/ Riparian	Sagebrush	Greasewood/ Saltbush	Mountain Shrub	Juniper	Conifer	Waste	Total
M acres	5,125	1,469	90,078	1,020	153	647	136	2,574	101,202
M percent	5	1.5	89	1	.3	.6	.1	2.5	100
I acres	38,841	20,487	1,195,254	11,212	8,292	4,949	14,339	22,879	1,316,253
I percent	3	1.5	91	1	.6	.4	1	1.5	100
C acres	455	248	13,577	0	0	162	0	283	14,725
C percent	3	2	92			1		2	100
Total acres	44,421	22,204	1,298,909	12,232	8,445	5,758	14,475	25,736	1,432,180
Total percent	2.9	1.5	91	.7	.5	.4	1	2	100

tion.) The grass vegetation type occupies only about 3 percent of the total EIS area. However, it is an important type for livestock and wild horse grazing.

Meadow/Riparian

The meadow/riparian vegetation type consists of meadows, containing mostly rushes and sedges, and riparian areas, where the vegetation community consists of willows, narrowleaf cottonwoods, water birch, chokecherry, aspen, bluegrasses, sedges, and rushes. This vegetation type occupies only about 2 percent of the total EIS area; however, it contributes a large portion of the forage for livestock grazing, because meadow/riparian areas are generally the areas of heaviest use due to the high quality forage and close proximity to water.

Sagebrush

The EIS area is dominated by the sagebrush vegetation type, which extends throughout the area. The average species composition for the sagebrush vegetation type is 32 percent grass, 8 percent forbs, and 60 percent shrubs. Big sagebrush is the most common subtype of the sagebrush vegetation type. The predominant plant species include Wyoming big sagebrush, basin big sagebrush, and black sagebrush. Also included in the sagebrush vegetation type is the rabbitbrush subtype which consists mainly of Douglas rabbitbrush and rubber rabbitbrush. Major grass species in the understory are Indian ricegrass, thickspike wheatgrass, Sandberg bluegrass, needlegrass, bluebunch wheatgrass, and western wheatgrass. On summer ranges or when there is an abundance of other forage plants, sagebrush is considered an undesirable plant for livestock grazing. The understory vegetation is preferred when accessible and provides the majority of the forage for livestock. However, sagebrush can be an important plant for some wildlife species such as mule deer, pronghorn antelope, and sage grouse.

Greasewood/Saltbush

The average composition of the greasewood/saltbush vegetation type is 14 percent grasses, 4 percent forbs, and 82 percent shrubs. The major plant species in this type are black greasewood and Gardner's saltbush. This type occurs on low flats in saline clay soils.

Mountain Shrub

The composition of the mountain shrub vegetation type averages 92 percent shrubs, 3 percent grasses, and 5 percent forbs. The major plant species in this type are bitterbrush, snowberry, big sagebrush, and ceanothus. This type occurs on foothills on the Lander Slope, Green Mountain, and Crooks Mountain. The principal use of this type is for wildlife forage.

Juniper

The composition of the juniper vegetation type averages 94 percent trees and shrubs, 3 percent grasses, and 3 percent forbs. This vegetation type consists mainly of juniper, sagebrush, and wheatgrass. It occurs on hills and low mountain slopes with shallow soils and is used primarily as cover for wildlife.

Conifer

The conifer vegetation type includes all rangeland in coniferous timber that supports grasses, forbs, or shrubs. The major overstory species in this type are lodgepole pine, limber pine, and quaking aspen. Some isolated pockets of Douglas fir and Engelmann spruce occur on Beaver Rim and Green Mountain. This type is used by big game and wild horses, primarily for cover.

Waste

This type includes all areas of dense timber and brush which have no value for grazing domestic livestock or have such slight value that they cannot be used economically, due to stand denseness, down timber, or sparseness of forage growth. This type also includes barren and other waste areas not located in timber or brush but so rough or inaccessible as to make their use by livestock improbable. This type may be used by wildlife for cover and food.

Production

Present forage demand and supply for the EIS area is shown in Table 2-6.

The EIS area is divided by Beaver Rim into two major regions known as major land resource areas (MLRAs). The area that extends from Beaver Rim north to the EIS area boundary is known as the Foothills and Basins East MLRA. The area that ex-

TABLE 2-6

PRESENT FORAGE DEMAND AND SUPPLY
[In pounds of air dry forage]

	Demand	Supply	Difference
Category I allotments	201,506,782	150,526,847	- 50,979,935
Category C allotments	10,056,124	1,601,711	- 8,454,413
Category M allotments	9,165,779	10,494,455	+ 1,328,676
Combined totals	220,728,685	162,623,013	- 58,105,672

Source: Green Mountain Weight Estimate Forage Survey, conducted with the field methodology described in the BLM Manual, Section 4412.11B.

tends from Beaver Rim south to the EIS area boundary is known as the High Plains Southeast MLRA. Current and potential vegetation production for these areas is shown on Table 2-7.

Condition and Trend

Where reference is made to range condition class in this document, the reference is to ecological condition, which was estimated from spot field checks and comparison of data from the Green Mountain Weight Estimate Forage Survey with data from the soil surveys discussed in the Soils section of this chapter. It was estimated that 70 to 80 percent of the area was in fair to low-good condition with a static to upward trend. There were some areas that were in poor condition and some that were in excellent condition. The areas in poor condition were generally near water and on level terrain. The areas in excellent condition were generally away from water or on steeper slopes.

Threatened and Endangered Plant Species

There are no species in the EIS area currently listed as threatened or endangered pursuant to the Endangered Species Act of 1973 (16 USC 1531). However, meadow pussytoes is under review for placement on a list of proposed threatened and endangered plants. This species occurs in moist meadow areas, often on hummocks with tufts of sedges and rushes, near Atlantic City and the Sweetwater River. Meadow pussytoes is accessible to livestock and may receive some grazing use.

SOCIOECONOMICS

Regional Economy

To adequately describe the affected environment, the analysis cannot be limited to the boundaries of the Green Mountain EIS area. Impacts of an economic nature tend to have a ripple effect throughout an area. Not only are the communities in the proximity of the activity affected, but nearby trade centers as well. For the purposes of this study, statistics for both Carbon and Fremont counties will be used. Except for population statistics, all figures will be reported on a county basis only, because further breakdowns were not available.

The communities of Lander, Riverton, and Jeffrey City in Fremont County are located in the EIS area. Rawlins, in Carbon County, is the major trade center for the area. Table 2-8 shows population figures for these communities.

Employment statistics for Carbon and Fremont counties are shown in Table 2-9. Table 2-10 shows employment by sector, and Table 2-11 shows income by sector. As shown in these tables, mining is the leading industry in Carbon and Fremont counties. This sector generates the most employment and has the highest total income. Furthermore, mining generates the highest tax base for county and state government revenues. Agriculture ranks sixth of the ten major sectors in employment and ninth in total earnings. Within the agricultural sector, livestock operators have the highest earnings and employment.

According to the Wyoming Crop and Livestock Reporting Service (1981), Carbon County is ranked second in the state in cattle production and fourth in the state in sheep production. Fremont County is third in cattle production and tenth in sheep production. Wyoming accounts for approximately 1.2 percent of the Nation's cattle production and 8.6 percent of the sheep production. The EIS area supplies approximately .0016 percent of the Nation's cattle production and .5 percent of the sheep production.

Another important aspect of the regional economy concerns revenues generated by hunting and fishing recreation expenditures. In a study done by the University of Wyoming (Phillips, 1981), it was estimated that the average expenditure per hunter and angler day was quite significant to state and local government, and to retail establishment revenues. These expenditures are listed by type of game species in Table 2-12.

Hunting and fishing in the EIS area has state and national importance. In 1980, the EIS area generated approximately 1.4 million dollars (approximately 1 percent of Wyoming's hunting and fishing revenues) from this type of recreation.

Livestock Operations

Size of Operations

Cattle, horses, and sheep are authorized to graze on public lands in the Green Mountain EIS area. At present, 96 operators are licensed to run livestock in 157 allotments. Cattle and horses occupy 156 of the allotments and use 158,318 AUMs (88 percent of the AUMs in the EIS area). Sheep occupy 12 of the allotments and use 21,522 AUMs (12 percent

TABLE 2-7

CURRENT AND POTENTIAL VEGETATION PRODUCTION

	Pounds of Forage per Acre per Year											
	Foothills and Basins East MLRA						High Plains Southeast MLRA					
	Upland Sites			Meadow/Riparian Sites			Upland Sites			Meadow/Riparian Sites		
	Shrubs	Forbs	Grasses	Shrubs	Forbs	Grasses	Shrubs	Forbs	Grasses	Shrubs	Forbs	Grasses
Average current production	300	65	250	70	345	2,930	265	50	175	70	410	1,800
Predicted range for potential production at climax condition[1/]	50-80	75-175	375-600	300-810	180-540	720-4,050	110-180	90-110	630-800	300-690	230-500	1,380-4,000

1/ Production potential varies from site to site.

Source: SCS Range Site Descriptions.

TABLE 2-8

POPULATION
[As of 1980]

Community	Population	Percent of Combined Population of Carbon and Fremont Counties[2/]
Rawlins	11,547	18.9
Riverton	9,588	15.7
Lander	7,867	13.0
Jeffrey City	[1/]900	1.5
Total	29,902	49.1

[1/]Estimate from Dick Fairservis, Town Administrator, November 1981.
[2/]As of 1980, the combined population of Carbon and Fremont counties was 60,888.

Source: Bureau of the Census, 1981.

TABLE 2-9

EMPLOYMENT STATISTICS

	Employment	Unemployment	Unemployment Rate
Fremont County	18,433	1,044	5.9
Carbon County	12,875	340	3.0
Total	31,308	1,384	4.4
State of Wyoming	243,627	8,792	4.0

Source: Employment Security Comm. Wyo., Res. Anal. Sec., 1981a.

TABLE 2-10

EMPLOYMENT BY SECTOR FOR CARBON AND FREMONT COUNTIES
[As of 1979]

Industry	Employment	Percent of Total Employment
Mining	7,020	25.42
Wholesale and retail trade	4,486	16.25
State and local government	3,975	14.39
Services	3,837	13.89
Contract construction	1,978	7.16
Agriculture		
Livestock	1/ 1,164	4.22
Other	499	1.81
Transportation and public utilities	1,629	5.90
Manufacturing	1,100	3.98
Federal Government	1,054	3.82
Finance, insurance, and real estate	874	3.16
Total	27,616	100.00

1/ Includes proprietors and hired help.

Source: Dept. Admin. Fiscal Control, Div. Res. Stat., 1981.

TABLE 2-11

INCOME BY SECTOR FOR CARBON AND FREMONT COUNTIES
[As of 1979]

Industry	Income (in thousands of dollars)	Percent of Total Income
Mining	200,443	43.01
Wholesale and retail trade	50,138	10.76
State and local government	44,811	9.62
Services	41,604	8.93
Contract construction	37,961	8.15
Transportation and public utilities	34,920	7.49
Manufacturing	19,632	4.21
Finance, insurance, and real estate	12,696	2.72
Agriculture		
Livestock	8,342	1.79
Other	3,575	.77
Federal Government	11,903	2.55
Total	466,025	100.00

Source: Dept. Admin. Fiscal Control, Div. Res. Stat., 1981.

of the AUMs in the EIS area). Domestic horse use is very light, because most operators just keep a few horses, primarily for herding and recreational use.

Operations in the EIS area vary in size from 8 to 16,583 AUMs (10 to 3,500 animal units (AUs)); 23 of the operators have fewer than 100 AUMs authorized use, 4 operators have 101 to 200, 11 operators have 201 to 300, 12 operators have 301 to 500, 19 operators have 501 to 1,000, and 36 operators have 1,000 or more. Control patterns for licensed AUMs in the EIS area vary; however, 12 percent of the operators control over 56 percent of those AUMs. This group is comprised mainly of the larger operators.

The number of AUMs used and the kind of livestock grazed may vary from week to week within the EIS area, depending on operator preference. Appendix 1 shows use during the current grazing season. The present allocation of 179,840 licensed AUMs of livestock grazing will support a total of 32,692 AUs during an average grazing season of May 15 to October 30 in the EIS area.

Types of Operations

Most of the small operators within the EIS area have cow-calf operations. In these operations, cows that produce a calf each year are retained for breeding. After a period of 6 to 12 months, most of the calves are sold; however, a few are retained for herd replacement. It is not uncommon for the operators in the area to run bulls with the herd year round so that calves will be born throughout the year; however, some of these calves die during severe winter weather.

The larger operators usually run yearling operations or combination cow-calf/yearling operations. These operators maintain a base breeding herd and hold the calves until they reach a weight of about 600 pounds (about 1 year) and then sell. Several other types of yearling operations are practiced within the area. Some operators do not maintain a base breeding herd; instead, they buy calves, hold them on BLM range over the grazing season, and sell them in the fall.

Other operators lease the cattle from an out-of-state or out-of-area corporation, run them on the range for the grazing season, and then return them to the owner in the fall. These operators are paid on the amount of weight gained during the grazing season.

Some of the operations are based in other states. Cattle are shipped in to graze on BLM range for the grazing season and then shipped back to feedlots for fattening after the grazing season. These cattle may be purchased from many different states or even locally, depending on cattle prices.

Sheep operations differ in many ways from cattle operations. Types of labor input and sources of revenue are two examples of the differences between a sheep operation and a cattle operation. Of the 96 livestock operators in the EIS area, there are only 3 sheep operators.

Some of the operators within the area are authorized to run livestock throughout the year. Conversions in kind of livestock grazed have been from sheep to cattle. Conversion from cattle to sheep has not occurred within the EIS area.

Average Operation

For the purposes of the economic analysis, an average of all ranching activities will be used. In this manner, an estimation can be made of the impacts on the livestock sector brought about by changes in grazing plans.

The information used in this analysis originated from a confidential collection of data provided by area livestock operators in 1979. Prices and costs were updated to 1981 figures using the U.S. Consumer Price Index (Employment Security Comm. Wyo., Res. Anal. Sec., 1981b).

The average ranch in the EIS area is a cow/yearling operation with 1,462 AUs. A ranch of this size uses 16,428 AUMs of feed plus 62 tons of protein supplement. Public lands provide 6,890 AUMs (42 percent) of this forage; 1,261 AUMs (7.7 percent) are provided through private, state, Bureau of Indian Affairs, and U.S. Forest Service leases; 5,046 AUMs (31 percent) are supplied by deeded lands; and 3,231 AUMs (20 percent) are provided by hay. The average rancher produces 1,777 AUMs (55 percent) of his hay and purchases another 1,454 AUMs (45 percent). Approximately 92 hours per week of unpaid labor are supplied by the owner/operator. This is supplemented by another 263 hours per week of hired labor. The ranch is the primary source of income for the operator.

The average ranch grosses $227,504 and has total costs of $183,603 resulting in a net return of $43,901. Kearl (1980) found depreciation to be approximately 12 percent of sales for an operation of similar size. If this cost is applied, net revenue decreases to $38,633.

Income from Operations

Livestock Sector. The 96 operators in the EIS area produce an estimated 64,502 AUs, of which about 32,692 AUs use public lands. Income for the

average ranch was estimated at $227,504, of which public lands contributed approximately $95,552 (42 percent). Livestock operations in the EIS area are an important segment of the livestock industry in Fremont and Carbon counties. In 1979, these operations earned 85 percent of the total livestock income in Fremont County and 39 percent of the total livestock income in Carbon and Fremont counties.

Government Sector. BLM's grazing fee in 1981 was $2.31. During this year, an estimated $415,430 was collected from operators in the EIS area.

Value of Public Lands to Livestock Production

Although BLM does not recognize a capitalized value for grazing preferences, public land forage is important to livestock operations in the area. The value of a licensed AUM consists of its capital value and its value to production, both of which are affected by the demand for the AUM and its productivity. Licensed AUMs add to the capital value of a ranch and therefore affect the ability of a rancher to borrow money and the resale value of the rancher's property. During the 1979 survey, ranchers in the EIS area unofficially reported sales of BLM privileges ranging from $28 to $50 per AUM, depending on the type of land involved and its proximity to base property. One operator claimed he paid $5,000 for the privileges of 18 AUMs. Larger purchases tended to have a smaller per unit price.

Sociocultural Attitudes

Families of ranch operators in the EIS area are characterized by a set of distinct attitudes and values. Ranching families have retained the outlook that is usually associated with rural, agrarian populations. They emphasize the importance of independence, self-reliance, and outdoor work, while distrusting government regulation, urban interdependence, and industrial occupations. Ranch families cling to what they conceive as a western way of life, one which they inherited from pioneer settlers. Despite rather low financial returns from ranching, they persist in ranch lifestyles. In doing so, ranchers express what has been labeled ranch fundamentalism, the belief that ranching leads to a higher state of well-being than an alternative way of life (Smith and Martin, 1972).

WILDLIFE

Nongame Wildlife

Many species of nongame mammals, birds, reptiles, and amphibians are found throughout the Green Mountain EIS area. No population data are available for these animals; however, a list of species is contained in the Moneta Planning Unit URA-3 and the Sweetwater Planning Unit URA-3.

Species of nongame wildlife are found in every type of habitat. Table 2-4 in the Vegetation section of this chapter provides a list of wildlife habitat types associated with the major vegetation types in the EIS area. These habitat types have not yet been mapped, and no acreage estimates are available.

The abundance and species diversity of nongame wildlife is greatest in habitat types with high diversity in structure and species of vegetation. Such habitat types include wetland-riparian, aspen, juniper, limber pine, and mountain shrubland.

The presence of surface water also contributes significantly to habitat value. Wetland-riparian habitat types, which occupy the least acreage in the EIS area, are of greatest importance for nongame wildlife. Table 2-13 provides an estimate of total acreage of wetland-riparian habitat in the EIS area.

Nongame wildlife abundance and species diversity is well below potential on most wetland-riparian habitat types in the EIS area. Overgrazing has adversely affected vegetative diversity, substantially reducing the suitability of the habitat for many species.

Game Mammals

Current Wyoming Game and Fish Department population objectives and present population estimates for major game animals are presented in Table 2-14, along with the acreage and condition of seasonal ranges used by these species. With the exception of mule deer, all big game populations are currently estimated to be at Wyoming Game and Fish Department population objective levels.

Small Game Mammals

Small game species in the EIS area include the cottontail rabbit, snowshoe hare, and red squirrel. Cottontail rabbits are found throughout the EIS area. Snowshoe hares and red squirrels are found

TABLE 2-12

AVERAGE HUNTING AND FISHING EXPENDITURES IN DOLLARS PER DAY FOR WYOMING
[As of 1980]

Species	Resident		Nonresident	
	Per Sportsman	State Total	Per Sportsman	State Total
Antelope	25.75	4,096,435	90.86	6,282,942
Deer	44.49	11,718,985	77.09	12,223,351
Elk	50.94	16,849,548	142.46	6,781,770
Moose	62.69	480,737	113.96	295,052
Sheep	79.04	242,139	244.00	233,160
Bear	45.52	128,169	108.90	619,964
Mountain lion	75.00	22,103	(1/)	(1/)
Bird and waterfowl	33.35	5,617,594	61.60	755,158
Turkey	44.27	291,539	57.06	116,980
Small game	21.21	3,473,822	44.04	142,712
Fish	49.28	75,427,391	33.43	7,758,030
Total		118,348,462		35,209,119

1/ Not surveyed.

Source: Phillips, 1981.

TABLE 2-13

WETLAND-RIPARIAN HABITAT
[Estimated surface acreage]

Physical Feature	Areas in the EIS Area	Acres on BLM Land in the EIS Area
Natural lakes-ponds	3,280	1,640
Beaver ponds	133	53
Stream-riparian 1/	15,223	4,113
Inventoried manmade reservoirs	975	878
Uninventoried manmade reservoirs	407	81
Total	20,018	6,765

1/ Based on an estimated average of 13 acres of riparian habitat per mile of fisheries stream in the EIS area. This figure does not include acres of riparian habitat along nonfisheries streams in the EIS area.

Source: BLM resource area maps, stream inventories, beaver pond inventories, and reservoir maintenance inventories.

TABLE 2-14

CURRENT GAME ANIMAL POPULATIONS, POPULATION OBJECTIVES, AND ACREAGES OF SEASONAL RANGES

Group or Species	Population Estimate[1]	Trend[2]	Wyoming Game and Fish Department Population Objectives[3]	Acreages (in thousands of acres) and Condition[4] of Seasonal Ranges				
				Crucial Winter	Winter	Yearlong	Summer	Other
Elk	2,550	(S)	2,550	33.6 (P-F)	50.5 (F-G)	18.9 (F-G)	20.6 (P-G)	9.0 (U)[5]
Mule deer	8,400	(I)	11,560	54.3 (F)		705.7 (F)	131.4 (F)	
Moose	225	(S)	225	45.9 (P)		10.8 (P)		
Pronghorn antelope	9,830	(S)	9,830	211.8 (P-G)		443.5 (F-G)	589.3 (P-F)	10.9 (P-F)[6]
Bighorn sheep	160	(S)	160	4.7 (F)		11.7 (U)		
Sage grouse	N.E.	(S)		75.2 (U)	105.0 (U)		215.0 (U)	
Blue grouse	N.E.	(S)				140.0 (U)		
Ruffed grouse	N.E.	(S)				180.0 (U)		
Chukar partridge	N.E.					115.8 (U)		
Hungarian partridge	N.E.					115.8 (U)		
Ducks	5,000-50,000						16.8 (U)	
Geese	200-600						3.2 (U)	

[1] N.E. indicates that no estimate is available.
[2] (S) indicates stabilized population and (I) indicates increasing population.
[3] Adjusted for the EIS area boundaries.
[4] (P) indicates poor condition, (F) indicates fair condition, (G) indicates good condition, and (U) indicates undetermined condition.
[5] Severe winter relief range.
[6] Restricted winter sites.

Source: Moneta Planning Unit URA-3, Sweetwater Planning Unit URA-3, and Wyoming Game and Fish Department's Strategic Plan for the Comprehensive Management of Wildlife in Wyoming.

at the higher elevations, in coniferous forests. Population levels and habitat conditions vary greatly throughout the EIS area.

Big Game Ungulates

Elk. Approximately 350 elk are found on Green Mountain in the southeast part of the EIS area and approximately 2,000 are found on the Lander Slope in the western part of the EIS area.

Elk habitat and seasonal ranges in the EIS area are shown on Map 2-4 (located in Volume 2 of this EIS). Seasonal ranges are characterized by the presence of nearly every major habitat type from sagebrush-mixed grass to highland coniferous forest. The yearlong ranges are generally used by elk throughout the year. However, during winters when snow depth becomes a hindrance to feeding and movement, the animals tend to concentrate on areas referred to as general winter ranges. During more severe winters, the elk become restricted to crucial winter ranges, which are the only areas where forage is accessible to the animals. This forage is found on windblown ridges and slopes. Extensive migrations do not usually occur, except during extremely severe winters when deep snow forces elk in the western part of the EIS area to move east onto severe-winter relief ranges, characterized by extensive windblown stands of big sagebrush and grass vegetation.

Elk movements from winter ranges in spring are influenced mainly by the availablity of new green forage. As forage becomes available, the animals move up toward higher elevation summer ranges that are forested. Calving areas totaling about 5,000 acres have been identified within and adjacent to the Green Mountain summer ranges.

The food habits of elk are very similar to those of livestock and wild horses; however, forage availability is a significant factor affecting the composition of elk diets. Generally, grasses and grasslike plants are preferred, but browse and forbs are fed on extensively in the absence of preferred forage species.

Competition for preferred forage among livestock, wild horses, and elk is adversely affecting elk habitat condition in the EIS area. Decreased availability of preferred forage has caused elk to feed heavily on browse. This has placed elk in direct competition with mule deer and other big game species that are also dependent on the browse component of the forage resource.

Surface disturbance resulting from energy and mineral exploration and development has reduced the availability of suitable elk habitat by more than 7,000 acres in the EIS area.

Mule Deer. During most of the year, mule deer can be found throughout much of the EIS area on yearlong ranges (shown on Map 2-5, located in Volume 2 of this EIS). Preferred areas typically have a diverse mixture of woodland, mountain shrubland, sagebrush-bitterbrush, and riparian habitat types, where cover is adequate and extensive stands of preferred browse species are available. Like elk, deer tend to concentrate on winter ranges when snows accumulate. During very severe winters, the deer are restricted to crucial winter ranges, which are the only areas where cover and browse are still relatively accessible. On many areas of mule deer winter range, riparian habitat types provide the only available cover and most of the available forage for wintering deer.

The deer spread out over yearlong and summer ranges in the spring as snow cover melts and succulent green forage becomes available. Riparian habitat types along water courses are the primary fawning areas, and are generally the first to turn green in the spring, providing the water and succulent forage essential to lactating does and the security cover necessary to hide newborn fawns.

Cover and water are limited on 200,000 to 300,000 acres of deer range in the EIS area. These areas are characterized by extensive sagebrush/mixed-grass vegetation, poor water distribution, and very low numbers of deer. Water and cover are adequate on the remaining 500,000 to 600,000 acres of deer range.

Forage competition between grazing animals is adversely affecting the condition of mule deer habitat in the EIS area. Livestock, wild horses, and elk feed heavily on browse when preferred forage species are unavailable because of overgrazing or deep snow. Consequently, the amount of browse available to mule deer is reduced. In addition, overgrazing of riparian habitat types has reduced the quality and availability of winter forage, cover, and fawning habitat for mule deer.

Surface disturbance due to energy and mineral exploration and development has reduced the availability of suitable mule deer habitat by approximately 14,000 acres in the EIS area. Habitat suitability has also been reduced on another 10,000 acres due to the subdividing and development of rural areas for homesites.

Pronghorn Antelope. Pronghorn antelope are distributed more widely in the EIS area than any other big game species. Antelope ranges (shown on Map 2-6, located in Volume 2 of this EIS) are characterized primarily by the habitat types associated with sagebrush, grass, and greasewood/saltbush vegetation. (See Table 2-4 in the Vegetation section of this chapter.) During severe winters, deep snow

forces antelope to concentrate on crucial winter ranges where sagebrush forage is more available on windswept ridges and slopes or in tall stands along drainages. As snow cover melts, the herds disperse widely throughout the EIS area on yearlong and summer ranges. Riparian habitat types along water courses are important concentration areas on yearlong and summer ranges. Water and succulent forage are usually available to antelope on these sites during the driest months of the year. Lack of dependable water appears to be limiting the distribution of antelope in some parts of the EIS area. Cover is adequate.

Movements toward winter ranges in the fall generally begin with the first winter snowstorm. The broad, general directions that herds take while migrating are shown on Map 2-6, located in Volume 2 of this EIS. Distances as great as 40 miles are covered by many of the animals. Current fencing patterns in the area have restricted antelope movements, resulting in some allotments receiving heavy antelope use while others receive only light use. Fencing along Highway 287 prevents many antelope from reaching preferred winter ranges. These animals concentrate along the fences on areas referred to as restricted winter sites. Habitat on restricted winter sites is in poor condition as a result of heavy use of available forage.

On a yearlong basis, big sagebrush, rabbitbrush, and other browse species make up the largest part of antelope diets in the EIS area. Grass is fed upon when it first begins to turn green in the spring, because it is the only succulent forage initially available (Severson, May, and Hepworth, 1968). Grass consumption is reduced drastically as soon as browse and forb species begin initial spring growth.

As with other big game species, forage competition between grazing animals is adversely affecting the condition of antelope habitat in the EIS area. Overuse of riparian habitat types by livestock and wild horses has reduced the availability of succulent forage important to antelope during dry, summer weather. In addition, fall and winter grazing by livestock and wild horses has resulted in the overuse of important winter browse forage on some antelope crucial winter ranges.

Surface disturbance due to energy and mineral exploration and development has reduced the availability of suitable antelope habitat by approximately 16,000 acres in the EIS area.

Bighorn Sheep. Two distinct parts of the EIS area (shown on Map 2-7, located in Volume 2 of this EIS) are used by bighorn sheep. A relatively large herd of approximately 150 animals uses habitat in the western part of the EIS area. A very small remnant herd uses habitat in the eastern part of the EIS area. Yearlong ranges may be used by bighorns at any time of the year; however, during severe winters, the sheep are restricted to smaller areas of crucial winter range where forage is more readily accessible. Habitat types characteristic of bighorn sheep ranges are primarily those associated with grass, mountain shrub, conifer, and waste vegetation types. (See Table 2-4 in the Vegetation section of this chapter). One lambing area has been identified in the Little Popo Agie Canyon, located on the boundary between the EIS area and the Shoshone National Forest.

Grasses, grasslike sedges, and shrubs make up the largest part of a bighorn's diet in the EIS area. Forage competition between grazing animals, described previously in the sections on elk and mule deer, is adversely affecting the quality and availability of forage on bighorn sheep ranges.

Cover is synonymous with escape terrain in bighorn habitat. Escape terrain is characterized by steep, rocky outcrops and cliffs adjacent to foraging areas. The lack of this escape terrain in the EIS area limits the amount of habitat available and thus, the size of the bighorn population. Water is adequate.

Moose. Moose are most abundant in the EIS area during the winter. About 80 percent of the winter population moves out of the area into the Shoshone National Forest as spring thawing begins and then returns in winter to concentrate on the yearlong and crucial winter ranges shown on Map 2-7, located in Volume 2 of this EIS. Most of the moose range in the EIS area is wetland-riparian habitat characterized by cottonwood, aspen, and willow-riparian habitat types along drainages. Stands of lodgepole pine and aspen intermingle with sagebrush-grassland and mountain shrub vegetation on surrounding uplands. Riparian habitat types that are heavily wooded are preferred for calving.

Preferred forage is primarily browse such as willow and other shrubs, with grasses and forbs making up the remainder of the diet. Aspen becomes an important source of forage for moose during winter. Forage competition between grazing animals has adversely affected the availability of forage and cover on moose ranges in the EIS area. Overuse has prevented reestablishment and regeneration of the riparian woodlands, and has also reduced the availability of preferred browse forage on surrounding uplands. However, cover and water are adequate, except on yearlong ranges along the lower Sweetwater River, where willow thickets are scattered and there are no forested habitat types on adjacent uplands.

Rural development of homesites on riparian habitat types around Lander is resulting in a direct loss of moose crucial winter range in the EIS area. Rec-

reational use of remaining crucial winter ranges continues to increase, creating additional stress for wintering animals.

Game Birds

Sage grouse are the most common and widespread game birds in the EIS area. These birds are solely dependent on sagebrush for food and cover from October to April. During severe winters, deep snow forces the birds to concentrate on winter ranges (shown on Map 2-8, located in Volume 2 of this EIS), where sagebrush is more readily available on the windswept ridges or in tall stands along drainages. Courtship occurs on strutting grounds of $\frac{1}{10}$ to 10 acres in size (Call, 1979) from mid-March to late May. Most hens nest within a 2-mile radius of the strutting grounds. Strutting/nesting complexes in the EIS area are shown on Map 2-8, located in Volume 2 of this EIS. By May, the grouse become heavily dependent on succulent spring forage for their nutrient requirements, especially forbs and grasses (Braun, Britt, and Wallestad, 1977). From June through September, the birds are usually found near riparian habitat types, where succulent forage, water, and insect food are normally available.

Stands of big sagebrush provide most of the cover needed by sage grouse. However, topographic features supplement sagebrush cover on crucial winter ranges.

Energy and mineral exploration and development has resulted in a loss of sage grouse habitat in the EIS area wherever sagebrush has been cleared. Sage grouse have also been adversely affected by livestock trampling and overgrazing on important use areas such as riparian habitat types and strutting/nesting complexes.

Blue and ruffed grouse are found in higher elevation, forested habitat in the EIS area. Areas characterized by a mixture of woodland and mountain shrubland habitat types are preferred. Breeding, nesting, and brood-rearing areas are typically found along the edges where these habitat types meet. Herbaceous understory vegetation provides important nesting and brood-rearing cover. Livestock grazing and trampling on nesting and brood-rearing cover has adversely affected habitat condition.

Two exotic species of partridge, chukar and Hungarian, have been introduced into the EIS area. Little information is available on habitat condition or trend for these species. Most Hungarian partridge habitat in the EIS area is on private land.

Waterfowl populations vary from year to year, depending on the availability of water. Wetland-riparian habitat (shown on Table 2-13, above) provides nesting and brood-rearing areas for several species. Livestock grazing and trampling of wetland-riparian habitat significantly reduces the suitability of these areas for waterfowl production.

Mourning doves are present throughout most of the EIS area from late spring to early fall. They nest in low numbers in nearly every type of habitat.

Threatened or Endangered Wildlife Species

Endangered wildlife species that may be found in the EIS area are bald eagles, peregrine falcons, and black-footed ferrets. An estimated 15 bald eagles winter in two small areas, one in the Little Popo Agie River Canyon and one in the Upper North Fork Canyon of the Popo Agie River. Both areas are adjacent to the Shoshone National Forest. Cottonwood trees along the river are preferred by the birds as hunting/resting perches. The majority of these trees are on private lands. Peregrine falcons are believed to migrate through the area in late fall and late winter each year. Although no nesting activity has been documented, peregrines have been sighted on Beaver Rim during the summer. An estimated 160,000 acres of whitetail prairie dog colonies in the EIS area are potential yearlong habitat for the black-footed ferret. No critical habitat has been designated for any threatened or endangered species in the EIS area.

WILD HORSES

Population and General Information

There are an estimated 1,423 wild, free-roaming horses in the Green Mountain EIS area. These animals breed in the summer; their numbers are increasing by about 20 percent annually. There are no wild burros in the EIS area. Table 2-15 shows wild horse inventory information for the EIS area by planning unit.

The wild horses appear to be in excellent health. Injured, sick, or emaciated wild horses are rarely seen. The EIS area is relatively remote and unvisited, despite the recent upsurge in mineral activity. Consequently, the wild horses can generally be viewed in a very natural setting unmarred by man-made intrusions. The horses are not greatly alarmed by visitors and can usually be approached to within a few hundred yards. Additional informa-

TABLE 2-15

WILD HORSE HERD INVENTORY INFORMATION
[N indicates that no information is available]

Date of Inventory	Inventory Count	Colts		Yearlings		Number of Bands	Band Size		
		Percent	Number	Percent	Number		Minimum	Maximum	Average
				Sweetwater Planning Unit					
March 4, 1974	178	N	N	N	N	N	N	N	N
January 31, 1975	337	3.6	12	.3	1	39	2	36	9
February 24, 1975	347	1.7	6	N	N	41	1	21	8
March 3, 1975	485	6.2	30	5.2	25	50	3	30	10
February 6, 1976	428	21.7	92	1.4	6	53	2	30	8
Summer 1976	580	22.9	113	N	N	45	1	41	13
April 1, 1977	471	1.9	9	N	N	52	2	29	9
September 27, 1977	420	19.0	80	N	N	50	1	34	8
April 2, 1979	492	14.4	71	N	N	70	1	31	7
March 11, 1980	380	6.1	23	N	N	39	1	41	10
March 9, 1981	640	1.2	8	9.4	60	60	2	51	11

TABLE 2-15--CONTINUED

WILD HORSE HERD INVENTORY INFORMATION

Date of Inventory	Inventory Count	Colts		Yearlings		Number of Bands	Band Size		
		Percent	Number	Percent	Number		Minimum	Maximum	Average
				Moneta Planning Unit					
February 6, 1975	376	16.0	60	N	N	39	1	41	10
March 3, 1975	346	4.3	15	N	N	42	1	19	8
Summer 1976	524	24.0	126	N	N	63	1	41	8
March 31, 1977	68	N	N	N	N	12	1	9	6
September 27, 1977	641	16.8	108	N	N	89	1	24	7
April 2, 1979	485	20.4	99	N	N	65	1	45	8
March 11, 1980	624	5.6	35	N	N	56	2	41	11
April 3, 1981	783	3.1	24	18.8	147	84	1	80	9

Note: All observations were made by BLM employees.

tion on inventories, characteristics, and history of wild horses in the Green Mountain EIS area is contained in the Moneta Planning Unit URA-3 and Sweetwater Planning Unit URA-3.

Habitat

No crucial habitat for wild horses has been identified in the EIS area. The areas of horse use are somewhat dependent on water supplies, although it is not uncommon to see wild horses more than 5 miles from water. Many of the water sources that wild horses use are on state or private lands. Most movement to and from water is in the early mornings and late evenings. In late summer, when water supplies are limited, herd movements are also limited. (Additional information on water sites used by wild horses in the EIS area can be found in the Sweetwater Planning Unit URA-3 and the Moneta Planning Unit URA-3.) The bands prefer to feed along draws, ravines, and other protected areas such as north or east facing slopes and small basins. However, in winter the horses are often found on exposed ridges which are blown free of snow. The wild horses consume approximately 15,200,000 pounds of forage and 5,193,000 gallons of water annually.

Distribution and Movement

Because of the open spaces in the EIS area, the wild horses are indeed free-roaming. They are scattered throughout the EIS area and use public, state, and private lands in the area at will. The horses in the EIS area are generally concentrated in the herd areas shown on Map 1-4 in the Description of the Proposed Action and Alternatives section in Chapter 1 of this EIS. Movement within the general distribution areas is normally confined to a 3- or 4-square mile area in which animals forage and water.

The horses move between areas of concentration. Wild horses from the Dishpan Butte Herd Area migrate to the East Beaver Creek Herd Area during winter months. Wild horses from the Antelope Hills Herd Area and the Green Mountain Herd Area move south of the EIS area boundary during the winter and mix with horses in the Seven Lakes area of the BLM Divide Resource Area. Horses in the Antelope Hills Herd Area also move back and forth across the southwestern boundary of the EIS area and mix with a large concentration of wild horses in the BLM Rock Springs District Continental Peak Herd Area, located just southwest of the southern boundary fence.

FISHERIES

Streams

Thirty-two trout streams in the EIS area flow for part of their lengths on public land. (See Map 2-9, located in Volume 2 of this EIS.) Brook trout, rainbow trout, brown trout, cutthroat trout, and mountain whitefish are present in these streams, with brook trout being the most common game fish. Brown and rainbow trout are relatively common, while cutthroat trout and mountain whitefish are rarely present. No other important game fish or rare, threatened, endangered, or sensitive fish are present in the EIS area streams.

Land ownership along these streams is approximately 580 miles private, 260 miles public, and 180 miles state. Of the 260 miles of stream that flow across public land, there are approximately 178 miles of perennial stream. Most of these miles of perennial stream support trout year-round. Approximately 153 of the 178 miles of perennial stream are creek-sized waters less than 15 feet wide. The larger Sweetwater River accounts for nearly all the remaining 25 miles of perennial stream crossing public land.

Important trout streams in the EIS area typically originate in forested, mountainous areas and flow into plains areas, which have low levels of precipitation. Summer flows in plains areas are typically less than flows upstream, and it is not uncommon for stream sections in plains areas to be completely dry or to flow only below springs.

A typical segment of trout stream flowing on public land in the area would provide a fair to marginal fishery for wild brook trout. Only a few miles of streams crossing public land are stocked with hatchery trout. On most stream sections, fishing pressure is probably light, because access is limited and fishing is typically marginal.

According to a 1977 Wyoming Game and Fish Department classification of streams (shown on Map 2-9, located in Volume 2 of this EIS), there are

no blue ribbon streams of national importance (Class 1 streams) in the EIS area. Of the 178 miles of perennial trout streams crossing public land, approximately 3 miles are classified as very good trout waters of statewide importance (Class 2 streams); 73 miles are classified as important trout waters of regional importance (Class 3 streams); and 61 miles are classified as low production waters of local importance (Class 4 streams). The remaining 41 miles of perennial trout stream crossing public land are classified as very low production waters, often incapable of sustaining a fishery (Class 5 streams).

The most important trout stream habitat on public land in the EIS area is a 10-mile segment of the Sweetwater River known as the Sweetwater Canyon. (See Map 2-9, located in Volume 2 of this EIS.) This is classified by the Wyoming Game and Fish Department as a Class 3 stream. Naturally reproducing brown and rainbow trout occur in this segment.

To evaluate the habitat conditions in the EIS area, BLM survey crews inventoried the public portions of the streams in 1975, 1976, and 1977. BLM survey techniques (Duff and Cooper, 1978) were used. Each stream was evaluated only once; therefore, no trend data are available.

Analysis of stream survey data shows that, in general, trout streams crossing BLM lands in the EIS area have too much pool area and too little riffle area for optimum trout production. Also, pools are typically not of high quality, while riffles commonly contain too much sediment to be good spawning habitat. Sediment in riffles also impairs the capability of riffle areas to produce trout food. The above situation can be partly attributed to the location of most BLM trout streams. Most BLM trout streams in the EIS area occur in foothills and lowlands where lower stream gradients and slower stream velocities are typical stream features. Lower gradients reduce the amount of riffle, while lower gradient and slower water favors sediment deposition.

Many public stream sections in the EIS area have been significantly damaged by ungulates (primarily cattle, sheep, and wild horses). The BLM survey rated approximately 25 percent of the miles of trout stream on public lands in the EIS area as sustaining heavy to excessive grazing and trampling damage to banks and vegetation. Damage to banks and vegetation is a very important factor determining trout production; the greater the damage, the lower the trout production (Bowers et al., 1979). Ungulates using streambanks influence trout habitat by affecting streamside vegetation, stream channel shape, pool-to-riffle ratio, stream temperature, stream bottom sedimentation, and stream channel stability.

Trout stream habitat conditions in EIS area trout streams crossing public land have been rated based on pool-to-riffle ratio, channel stability, pool habitat, spawning habitat, and ungulate damage to riparian areas (Table 2-16). Overall, trout stream habitat on public land in the Sweetwater drainage averages low-fair. Stream habitat in the Wind River drainage averages high-fair.

Lakes and Reservoirs

Three small reservoirs and one lake on public land in the EIS area contain game fish. (See Map 2-9, located in Volume 2 of this EIS.) Picket Lake, a remote lake which at one time contained largemouth bass, now supports only small-sized yellow perch. Big Atlantic Gulch Reservoir, which is adjacent to a BLM campground, is pond-sized and is stocked with fingerling brook trout and cutthroat trout. Above the reservoir is a beaver dam complex and a quarter mile of stream fed by springs. The area above the reservoir may support some natural trout spawning. Livestock are damaging the vegetation and banks of the reservoir, beaver ponds, and the stream.

The other two small reservoirs, Silver Creek and Antelope Springs, are stocked with catchable-sized rainbow trout. Silver Creek is also stocked with fingerling brook trout. These reservoirs support rapid trout growth, but winterkill tends to occur in both reservoirs. These reservoirs also provide water for livestock. This results in trampling damage to banks, which adversely affects the trout-producing capacity of the reservoirs.

CULTURAL RESOURCES

Prehistoric

The Green Mountain EIS area lies within the Northwestern Plains Culture Area (Frison, 1978). This culture area had distinct cultural traditions that continued until contact with Euro-Americans. Big game hunting was an important activity, and nomadic, usually small, hunting and foraging groups were the norm.

Prehistoric sites throughout the Northwestern Plains are usually associated with environmental determinants such as water sources, availability of

TABLE 2-16

TROUT HABITAT CONDITION

Stream	Miles of Perennial Stream on Public Land	Average Habitat Condition[1]	Game Fish Present[2]
	Sweetwater Drainage		
Upper Sweetwater River (includes Sweetwater Canyon)	19.6	Good	BK, BR, RB, CT
Lower Sweetwater River	2.8	High-fair	BK, BR, RB
Willow Creek I	21.5	Low-fair	BK, CT
Cooper Creek	1.3	Low-fair	BK, CT
Cottonwood Creek	18.0	High-fair	BK
Crooks Creek	4.4	Poor	BK, CT
Sage Hen Creek	0.1	Poor	BK
Long Creek	6.8	Low-fair	BK
Alkali Creek	9.0	Poor	BK
Willow Creek II	1.6	High-fair	BK, BR, RB
Mormon Creek	0.1	Poor	BK
Strawberry Creek	2.7	Poor	BK
Deep Creek	3.5	Low-fair	BK
Harris Slough	0.1	Poor	BK, RB
Tin Cup Creek and Buffalo Creek	1.4	Low-fair	BK

TABLE 2-16--CONTINUED

TROUT HABITAT CONDITION

Stream	Miles of Perennial Stream on Public Land	Average Habitat Condition[1/]	Game Fish Present[2/]
		Sweetwater Drainage--Continued	
Rock Creek	10.5	High-fair	BK, BR, RB, CT
Willow Creek III	15.5	High-fair	BK, CT
Slaughterhouse Gulch	1.5	Poor	BK
Pine Creek	2.5	Low-fair	BK
Total for the Sweetwater Drainage	122.9		
		Wind River Drainage	
Twin Creek	2.8	Low-fair	BK
Little Popo Agie River	2.0	Good	BK, BR, RB, WF
Red Canyon Creek	0.8	High-fair	BK
Deep Creek	2.9	High-fair	BK
Barrett Creek	6.4	High-fair	BK
Cherry Creek	4.6	High-fair	BK, BR, RB
Baldwin Creek	8.5	Good	BK, BR, RB
Squaw Creek	1.6	Good	BK, BR, RB
Crooked Creek	1.1	Poor	BK
North Popo Agie River	1.2	Good	BK, BR, RB, CT, WF

TABLE 2-16--CONTINUED

TROUT HABITAT CONDITION

Stream	Miles of Perennial Stream on Public Land	Average Habitat Condition[1/]	Game Fish Present[2/]
		Wind River Drainage--Continued	
Mexican Creek	1.2	Good	BK
Sawmill Creek	0.1	Low-fair	BK
Beaver Creek	21.6	Low-fair	BK, BR, RB, CT
Total for the Wind River Drainage	54.8		

1/ Habitat condition is based on pool-to-riffle ratio, channel stability rating, pool habitat rating, spawning habitat rating, and percent ungulate damage. Rating represents average condition of trout streams that cross BLM land.

2/ Abbreviations: BK = eastern brook trout, BR = brown trout, RB = rainbow trout, CT = cutthroat trout, and WF = mountain whitefish.

Source: BLM Stream Survey Files, 1975-1977.

plants used for food, game availability, material availability, climatic characteristics, etc. In the Green Mountain EIS area, lithic procurement sites usually occur near sources of usable stone, and campsites and seasonal habitations generally occur near water sources and/or available plants or animals used for food. Locations of other types of sites are not as predictable and can be found throughout the area. The most common locations for sites are along terrace and ridgetop edges, near springs, near water courses (perennial and ephemeral) and lakes, in sand dune areas, near rock outcrops, and in rock shelters and caves. Sites are generally located on more gently sloped terrain.

As of November 1981, there were 269 recorded prehistoric sites in the EIS area (BLM site files). These included 4 quarries, 108 lithic scatters, 13 fire hearths, 95 campsites (limited and seasonal), 29 stone circles and/or alignment sites, and 5 petroglyphs or pictographs. There are no known traps, drive lanes, or kill sites in the EIS area. Of these sites, six have been determined eligible for nomination to be enrolled on the National Register of Historic Places (Table 2-17).

Suspected high-density areas for prehistoric sites in the EIS area have been delineated on the basis of typical environmental and topographical conditions known to be favored by prehistoric people on the Northwestern Plains. Suggested high density areas were arrived at by this method because cultural inventories in the EIS area cover only a small fraction (approximately 0.5 percent) of the total EIS area. Most of these inventories were done in response to specific construction project requests. These relatively few, nonrandom inventories do not comprise a scientifically reliable sample.

Suspected high-density prehistoric site areas fall along the Sweetwater River, the Popo Agie River, the Little Popo Agie River, the North Fork of the Popo Agie River, major tributaries to these rivers, and most of the larger creek drainages in the area. Regional areas of high potential for cultural resources include the Sweetwater Rocks area north of Jeffrey City, the South Pass foothills of the Wind River Range, Green Mountain, the Picket Lake area, and Sand Draw.

Historic

The EIS area is rich in historic events and remains. Rich game resources, well-watered areas, grassy areas, and South Pass, which provided a route over the Rocky Mountains, all contributed to early and continuing use of this area by fur trappers, hunters, emigrants, livestock operators, and settlers. The discovery of gold in the South Pass area caused an increase in activities in the region and spurred settlement and economic growth.

Cattle ranching was proven feasible in the latter half of the 19th century, and by the 1880s, ranching was a major economic activity. Sheepherding also became a significant activity. Settlement and growth slowly increased from this time onward, spurred by increased mineral exploration and development, tourism, farming, and ranching.

Based on available historical data from the EIS area, several suspected high-density zones for historic sites have been identified. Major historical sites and localities include the Oregon-Mormon Trail with its famous landmarks like Devil's Gate, Split Rock, Rocky Ridges-St. Mary's Station, and South Pass. During its brief existence, the Pony Express used much of the Oregon Trail in the EIS area. Stage routes, including the original Overland Trail route, the Rawlins-Ft. Washakie stage route, and the Point of Rocks-South Pass route, also ran through the area.

The South Pass mining district consisted of several communities, including Atlantic City, Miner's Delight (Hamilton City), Lewiston, and Fort Stambaugh, a military outpost. Hudson, an historic coal mining community, is located 10 miles northeast of Lander.

A total of 37 historic sites have been recorded in the EIS area. Most of these date from the Oregon Trail or the South Pass mining boom heydays in the mid-1800s. Cabins, campsites, ranches, mining communities, stage stations, trading posts and stores, etc., make up the majority of the recorded sites. Eleven of these sites have been determined eligible for nomination, have been nominated, or are enrolled on the National Register of Historic Places. Table 2-17 shows the seven which could be affected by the Proposed Action or alternatives.

VISUAL RESOURCES

Public lands in the Green Mountain EIS area exhibit a great degree of diversity. They include gently rolling hills, high bluffs and plateaus, narrow river canyons, and high rims. Small mountain ranges vary in type from huge monolithic granite masses to gentle forested slopes. Major vegetation types include grass, meadow/riparian, sagebrush, greasewood/saltbush, mountain shrub, juniper, and conifer.

Landscape character is determined by the relationship between four basic elements: color, line, form, and texture. The dominant colors in the EIS

TABLE 2-17

RECORDED PREHISTORIC AND HISTORIC SITES WITH NATIONAL REGISTER STATUS
[All sites are located in Fremont County]

Site Name	Site Type	Site Location	National Register Status	
			Nominated	Eligible for Nomination
		Prehistoric		
Indian Cave	Occupied cave	T. 27 N., R. 91 W.[1/]		X
Green Mountain Stone Rings and Directional Arrows	Stone circles and stone arrow	T. 27 N., R. 91 W.[1/]		X
Midland	Paleo-Indian campsite	T. 27 N., R. 91 W.		X
Jeffrey City Rock Mines	Habitation	T. 30 N., R. 92 W.		X
Wagon Bed Spring	Campsite	T. 32 N., R. 95 W.		X
Alkali Creek Stone Circles	Seasonal habitation	T. 28 N., R. 96 W.[1/]		X
		Historic		
Hamilton City[2/]	Historic town	T. 29 N., R. 99 W.	X	
Fort Stambaugh	Historic military post	T. 29 N., R. 99 W.	X	
Ice Slough	Historic slough	T. 30 N., R. 94 W.[3/]		X
Three Crossings Stage Station	Telegraph, stage, and Pony Express station	T. 29 N., R. 91 W.[3/]		X

TABLE 2-17--CONTINUED

RECORDED PREHISTORIC AND HISTORIC SITES WITH NATIONAL REGISTER STATUS
[All sites are located in Fremont County]

Site Name	Site Type	Site Location	National Register Status	
			Nominated	Eligible for Nomination
	Historic--Continued			
Mormon Handcart Company	Location of handcart company disaster	T. 29 N., R. 99 W.		X
St. Mary's Station	Stage and Pony Express station	T. 29 N., R. 96 W.		X
Crooks Gap Stage Station	State station	T. 22 N., R. 92 W.3/		X

1/Site is located on state land.
2/Also known as Miner's Delight.
3/Site is located on private land.

area are the browns, reds, and greys of soils and rocks and the greens, yellows, and browns of vegetation. These colors vary with changes in season and weather. Lines are distinct in the stratification of soil and rock outcrops, changes in vegetation, and along various topographic features. Form (topography) varies from steep-walled canyons (Sweetwater Canyon) to rugged mountains (Sweetwater Rocks). Texture results from different vegetation types, erosion patterns, and surface rock and soil features. These four basic elements combine to give the EIS area the overall appearance of being open, rugged, and natural.

Much of the area is generally free of cultural modifications. Examples of existing intrusions are mining areas, oil and gas fields, and fences built to control livestock. The overall impact of these intrusions on the visual resources of the area is quite low in comparison to the total area and the large number of acres of undeveloped public lands.

RECREATION

The Green Mountain EIS area affords hunting and fishing opportunities of regional and national importance. Opportunities abound to hunt big game (deer, elk, antelope, and moose) and small game and birds (cottontail rabbits and grouse). Recreational hunting and trapping of predators, primarily coyotes, red foxes, and bobcats has increased greatly in recent years. Other recreation activities occur in the Green Mountain EIS area; however, they would not be affected by any of the alternative forms of management and are therefore not included in this analysis.

Mule deer are hunted throughout the EIS area; however, hunting is concentrated in areas of denser vegetation and more rugged topography. Elk are hunted in the Green Mountains, the South Pass area, and elsewhere on the periphery of the Wind River Mountains. Moose are hunted in the South Pass and Wind River areas. Antelope are found throughout the EIS area in large numbers. Antelope hunt areas, established by the Wyoming Game and Fish Department, cover the entire area. The area is nationally known for antelope hunting and is the location for the nationally famous, invitation-only Lander One Shot Antelope Hunt.

Total hunting use in 1980 was approximately 21,750 visitor days. Big game hunting accounted for 17,400 visitor days: 3,850 for elk hunting, 50 for moose hunting, 10,000 for deer hunting, and 3,500 for antelope hunting. Small game and bird hunting and predator hunting and trapping accounted for the remaining 4,350 visitor days (Wyo. Game & Fish Dept., 1981; Moneta Planning Unit URA-3; Sweetwater Planning Unit URA-3; and BLM Lander Resource Area personnel). The 17,400 visitor days for big game hunting was approximately 80 percent of total hunting and 20 percent of total recreational use of the EIS area.

The primary areas for fishing in the EIS area are on the Sweetwater River and in the South Pass area. Some fishing occurs in the Green Mountains. The Sweetwater River, especially Sweetwater Canyon, is of regional importance. The remainder of the fishing opportunities in the EIS area are mainly of local interest. Total fishing use makes up approximately 7,500 visitor days per year (Moneta Planning Unit URA-3 and Sweetwater Planning Unit URA-3).

CHAPTER 3

ENVIRONMENTAL CONSEQUENCES

IMPACTS OF THE PROPOSED ACTION AND ALTERNATIVES

Introduction

A Proposed Action and four alternatives are considered in this EIS. In this chapter, the anticipated impacts that would result from the Proposed Action, the Elimination of Livestock Grazing alternative, the Enhanced Livestock Grazing alternative, the No Action alternative, and the Management Based on Currently Available Forage Data alternative are discussed. For an explanation of the Proposed Action and these alternatives, see Chapter 1 of this EIS. The following assumptions are being made for the purpose of analyzing the Proposed Action and alternatives:

1. In the Proposed Action, we recommend monitoring and consultation prior to making adjustments in levels of any grazing animals. Forage data shown in Appendix 2 are used as the basis for the extent of adjustments in animal numbers. It is not possible at this time to indicate which Category I allotments would experience adjustments, because monitoring data and consultation information are not yet available. However, a figure of six years following the EIS for occurrence of initial adjustments has been used. It is assumed for the Proposed Action that supply presently equals demand in the Category M and Category C allotments.
2. Because the length of short-term and long-term impact varies for each resource value, no general assumption has been made for the lengths of short-term or long-term impacts. Assumptions will be stated in each analysis section.
3. Management of wildlife populations would continue through harvesting authorized by the Wyoming Game and Fish Department, and the maximum population levels would remain as they are in the Wyoming Game and Fish Department's strategic plan.
4. All necessary funding and manpower would be available to implement the Proposed Action and alternatives as stated in Chapter I of this EIS.
5. Where magnitude and location of management actions are unknown, the worst-case impacts have been analyzed for each resource, except where otherwise indicated. Only significant impacts and impacts to certain important items such as threatened or endangered species, drinking water, cultural and historical values, air quality, and wild and scenic rivers were documented.
6. If site-specific grazing management plans were initiated after this EIS, an environmental assessment would be prepared by an interdisciplinary team to analyze the impacts of specific management systems and improvements.

Soils

General Effects of Management Actions

Impacts to soils can vary considerably, depending on the extent and location of actions proposed for each alternative. In Table S-1 (located in the Summary section of this EIS) the long-term, best-case and worst-case effects on soil are compared for the Proposed Action and alternatives. Short-term effects are expected in the first year of implementation, or before management actions are fully established. Long-term effects result after management actions are fully established. Unless otherwise noted, discussions of impacts to soils are for the long-term best case.

Quantitative estimates of projected sediment yields could not be made, because data collected in the EIS area does not include percentages for vegetative cover, and specific management actions are not available by allotment. Reductions in sediment yield could result from implementation of management actions for Category I allotments. Rangeland production in the EIS area may be naturally low where it is limited by soil or climatic conditions (generally in the Category M and C allotments), or it may be reduced by overgrazing (generally in Category I allotments). Where productivity has been reduced by overgrazing, management for

rangeland improvement might lead to an increase in vegetative cover. Thompson (1968) indicates that elimination of grazing in arid climates adds little protective vegetation to rangelands. Slightly more new growth would be expected in the EIS area, which has more rainfall. According to Packer (1961), cover is the main factor in sediment yield reduction. An increase in plant cover would reduce sediment yield in the following ways:

1. Splash erosion would be decreased, which is correlated to decreased sediment yield (Branson and Owen, 1970).
2. A decrease in sheet erosion would result, especially on medium and fine textured soils (Packer, 1961).

In allotments where a reduction or elimination of livestock grazing was required to improve range condition, soil erosion, and therefore sediment yield, would be reduced due to a decrease in livestock trampling. Decreasing livestock trampling would have the following effects on soils:

1. A reduction in soil compaction (Lull, 1959, and Packer, 1961) resulting in decreased bulk density and increased soil porosity (Rauzi and Hanson, 1966).
2. Increased soil structure stability (Rauzi and Fly, 1968).
3. Increased soil infiltration (Woodward, 1943).
4. Increased litter accumulation by as much as 2.5 times on lightly grazed areas compared to heavily grazed areas (Rauzi and Hanson, 1966) and a long-term increase in organic matter and fertility.

Trampling has its maximum effect on: Medium and fine textured soils when moisture is between field capacity and wilting point, soils with low organic matter, and bare soils where splash erosion contributes to compaction (Lull, 1959). According to Lull, compaction is confined mainly to the top 6 inches of soil. There is evidence of soil recovery from the effects of compaction after 7 years in the 0- to 2-inch layer and full recovery after several decades on some sites.

Other management alternatives which might improve range condition are redistribution of livestock by fencing, establishment of new water developments, and vegetation conversions. The short-term effect of these actions on soils would be an increase in sediment yield. The long-term effect would be a reduction in sediment in the allotment as a whole, due to improved livestock distribution. In allotments where vegetation conversions were used to establish desired range conditions, soils would be affected. Conversion would cause an increase in sediment yield in the short term. Of the conversion methods available, spraying would be the least detrimental to soils and would cause the least increase in sediment yield. Other methods of vegetation conversion are plowing and burning. The main effects of these methods on soils would be:

1. Elimination of all cover and increased erosion and sediment yield (Packer, 1961).
2. Significantly reduced water infiltration into the soil (Gifford, 1972).
3. Increased sediment yield the first year following plowing (Gifford, 1972).

The long-term impact on soils from vegetation conversion would be a decrease in sediment yields, not only on the revegetated area but on adjacent areas where grazing pressure would be reduced due to increased forage availability and better distribution of livestock.

Livestock turnout dates and seasons of use, where not consistent with range readiness might be altered. Soil moisture levels are the main factor in determining proper turnout dates and therefore correlate with range readiness. Altering turnout dates and seasons of use based on range readiness would lead to a reduction in sediment yields.

Proposed Action

Implementation of the Proposed Action would not significantly affect soil resources in Category M and C allotments. There would be a significant reduction in sediment yield in the Category I allotments in the long term because:

1. Deferment of grazing, elimination of grazing, rest rotation, and other management actions would be used to improve productivity and soil conditions.
2. Plant communities would be managed for improvement in productivity by redistribution of total grazing, vegetation conversions, adjustment of turnout dates, and other methods.
3. Better livestock grazing distribution and, to a smaller degree, wildlife distribution would occur due to improved water distribution.
4. In riparian and other areas, where fencing would be established to eliminate or reduce grazing, there would be increased vegetative cover and improved soil conditions.

In the best case, selection of the Proposed Action would be beneficial, and in the worst case would have a neutral effect. The actual long-term effects of the Proposed Action would depend on the location and extent of range improvements implemented.

Elimination of Livestock Grazing

Eliminating livestock grazing would have the immediate effect of reducing livestock trampling and increasing vegetative cover. The long-term effect of this alternative would be a reduction in sediment yields on BLM lands. However, the magnitude of the decrease in sediment yields would be less than for the Proposed Action because of the following factors:

1. Under this alternative, only those range improvements necessary for wildlife or wild horses would be maintained. Therefore, the decrease in total grazing pressure would be paralleled by a decrease in management to improve rangeland condition.
2. Plant communities would continue their current trends in most areas. Previously overgrazed areas would continue declining in trend and increases in production or vegetative cover would be minimal on those areas, thereby resulting in minimal sediment yield reductions.
3. Wildlife and wild horses would not be encouraged by fencing or new water sources to use overgrazed or drastically disturbed sites. They would continue to use some presently overutilized areas near existing water sources. This would be especially significant on those allotments where wild horse numbers would increase.
4. Reductions in use of areas adjacent to water sources would not be proportional to reductions in total animal numbers (Mueggler, 1965). Grazing pressure on areas adjacent to water is more dependent on amount and distribution of water than on animal numbers. This would be especially significant on those allotments with projected wild horse increases.

Overall, under this alternative, an increase in vegetative cover and a decrease in disturbance from trampling would occur in most riparian areas. Since livestock generally spend a greater proportion of their time in riparian areas compared to wildlife or wild horses, a significant reduction in disturbance would be seen. This reduction would be partially offset by increases in use by wild horses. Other effects of this alternative, in both the best and worst cases, would depend largely on the increases in wild horse numbers and the distribution of animals resulting from increases.

Enhanced Livestock Grazing

A short-term effect of this alternative on soils and sediment yield would be a temporary increase in sediment yield on areas affected by vegetation conversions and on areas disturbed by new fencing or water developments. Increased livestock numbers could also cause an increase in sediment yield in riparian, water development, and heavy use areas until proper livestock distribution was achieved.

Under this alternative, improvements in soil condition and vegetative cover could occur in some areas that are presently overgrazed. In other areas, which now experience limited use, levels of sediment yield could increase. The effect of these changes in sediment yield would range from slightly beneficial to slightly detrimental on soil resources and sediment yield over the whole EIS area. However, they could be very significant on specific affected areas.

The long-term effect of this alternative would be a return to present sediment yield levels, or, in the best case, lower, as livestock use was adjusted to estimated grazing capacity. In the worst case, increased livestock numbers could accelerate deterioration of overgrazed and riparian areas if range improvements were not extensive enough or were improperly located.

No Action

No significant changes from the existing situation would be expected under this alternative. Some heavy use areas now affected by excessive grazing intensity and poor distribution of livestock would continue to deteriorate; however, soils and sediment yields over the entire EIS area would remain relatively unchanged. Since erosion levels are presently below the rate of soil formation, a freezing of existing management programs would not significantly affect sediment yield in the EIS area as a whole. This alternative would have a neutral effect on soils in the best case and because continued deterioration would occur in some areas a detrimental effect in the worst case.

Management Based on Currently Available Forage Data

Impacts from implementation of this alternative would be approximately the same as for the Proposed Action, but would occur more rapidly.

Hydrology

General Information and Assumptions

Impacts to water resources can vary considerably, depending on the extent and location of ac-

tions proposed for each alternative. In Table S-1 (located in the Summary section of this EIS), long-term effects on water resources are compared for the Proposed Action and alternatives. In general, surface water quality would be improved most from those alternatives that involve elimination or reduction of disturbance to riparian areas and areas adjacent to water sources. Short-term effects are expected in the first year of implementation, or before management actions are fully established. Long-term effects result after management actions are fully established. Unless otherwise noted, discussions of impacts to water resources are for the long-term best case.

In determining impacts to water quality and quantity, the following assumptions have been made:

1. Where poor water quality is a function of overgrazing near a water source:

   a. Reductions in total grazing pressure would not improve water quality as much as fencing to eliminate all use, or improving water distribution for all grazing animals.

   b. The potential of riparian areas to return to good condition and be effective as sediment traps would depend greatly on present water table levels and the amount and distribution of sediment presently in those areas.

2. In areas where allotments do not have the potential to improve in cover or soil conditions (generally the Category M and C allotments), water quality would not be improved significantly by reductions in grazing intensity.

3. Overgrazing does not always correlate with increased runoff and reduced water quality. Except where overgrazing is a function of proximity to water, the same areas that are overgrazed due to good available forage are those areas with optimum soil moisture infiltration and retention.

4. Effects on water quality and quantity are not only determined by the location and extent of range improvements but also by climatic factors, which give rise to runoff and the potential for surface water contamination. Runoff, and the ability of that runoff to deposit material into surface waters, is highly dependent on rainfall intensity, duration, and occurance. For example, sites severely disturbed by overgrazing may not produce runoff unless precipitation is intense enough, long enough in duration, and at the proper time of the year to carry sediment into a water source.

Proposed Action

Water Quantity. In general, water quantity would not significantly change in the EIS area as a result of implementation of the Proposed Action. Water consumption by grazing animals would be negligible.

Groundwater recharge might increase on some Category I allotments. These increases would result from improved soil infiltration and reduced runoff due to increased vegetative cover, improved grazing systems, and reduced soil disturbance.

Water Quality. Water quality would not be significantly affected on watersheds in Category M and C allotments under the Proposed Action. In Category I allotments, the surface water quality would improve due to reduced levels of TDS, suspended sediments, nitrates, and fecal coliform. On Category I allotments where a reduction in grazing intensity is the recommended action, water quality would improve, because the increase in vegetative cover and reduced livestock trampling would result in reduced sediment yield (as discussed in the Soils section of this chapter) and lowered TDS and suspended sediment levels. The improved water quality would be especially evident in intermittent streams where surface water is the direct result of seasonal runoff.

Water quality would also be affected by management alternatives used to redistribute livestock (e.g., fencing, new water developments, and vegetation conversions). In the short term, these management alternatives would cause a reduction in vegetative cover and soil infiltration, resulting in lower water quality due to increased sedimentation. (See the Soils section of this chapter.) The long-term effect would be a return to present water quality levels or a slight increase in quality on some watersheds, once vegetation and soils became stabilized. Improved water quality could be significant where riparian areas were fenced to reduce soil disturbance by trampling and increase vegetative cover.

On Category I allotments where vegetation conversions are recommended to improve range condition, the use of herbicides as a means of conversion would have the least impact on surface water. Spraying with herbicides would result in the least amount of sedimentation, and TDS and suspended solid levels would increase less than with plowing or burning. Plowing and burning on some watersheds could cause significant sedimentation to occur, with TDS and suspended sediment levels above federal and Wyoming standards in the short term and a return to present sediment levels or below in the long term.

The beneficial results from proper turnout dates and seasons of use on soils and vegetation (discussed in the Soils section of this chapter) would lead to reduced sedimentation. Reduced sedimentation would mean lower TDS and suspended sediment levels in watersheds affected by such changes in turnout dates and seasons of use.

Elimination of Livestock Grazing

Water Quantity. Effects on surface water quantity under this alternative would be negligible, because water losses from evaporation far exceed current livestock consumption. Groundwater supplies might increase in the long term as vegetative potentials were reached and soils recovered from effects of livestock trampling.

Water Quality. In the overall EIS area, a slight improvement in water quality would be expected under this alternative. Sedimentation would decrease as overused areas were stabilized, and fecal coliform counts would decrease. Since water quality levels in most areas are within federal standards (as shown in Table 2-2 in the Hydrology section in Chapter 2 of this EIS), the expected reductions in TDS, suspended solids, and coliform levels would not be significant in most perennial streams. TDS levels, suspended sediment, and coliform levels in some intermittent streams would be reduced significantly, since the vegetative cover in some overused watersheds and riparian areas would become stabilized. The expected reduction in soil disturbance by trampling, through elimination of livestock, would significantly improve water quality on some water development and riparian areas. This improvement would parallel an increase in streambank stability. However, the improvement would be partially offset by the concentration of animals closer to those areas (Mueggler, 1965).

Enhanced Livestock Grazing

Water Quantity. The short-tèrm effect of this alternative would be an increase in surface water quantity on some watersheds affected by management activities such as fencing, water developments, and vegetation conversions. These increases would be the result of decreased vegetative cover and reduced soil infiltration.

The long-term effect from increased livestock use under this alternative would be reduced vegetative cover and reduced soil infiltration caused by trampling by livestock on riparian areas, areas near water developments, and other heavy use areas. This would lead to an increase in quantity of runoff (as shown in the Soils section of this chapter).

Water Quality. Under this alternative, reduced vegetation cover and increased soil disturbance would cause increased sedimentation, and water might decline in quality because of increased TDS, suspended sediment, nitrates, and fecal coliform levels. Overall, water quality in the EIS area would remain within federal and Wyoming standards (as shown in Table 2-2 in the Hydrology section in Chapter 2 of this EIS), but increased livestock use in some riparian areas near water developments and watersheds might result in a significant decline in adjacent water quality. In areas where vegetation conversions would improve range condition, the long-term effect on water quality would be beneficial. Improved range condition would lead to reduced sedimentation, resulting in reduced levels of TDS and suspended sediments.

No Action

Impacts from this alternative would be insignificant to water quantity and quality in the EIS area as a whole. Some overused riparian areas and watersheds would produce higher levels of TDS and coliform, reducing water quality in adjacent surface water. Continuation of existing management systems would result in a continual decrease in the quality of surface water originating from those overused riparian areas and watersheds.

Management Based on Currently Available Forage Data

Impacts on water resources from implementation of this alternative would be approximately the same as for the Proposed Action.

Vegetation

General Effects of Management Actions

The discussion of impacts to vegetation will be in terms of predicted changes in production and range condition toward or away from climax conditions. Impacts will also be discussed in terms of short-term and long-term time frames; 1 to 5 years will be used for the short term, and 5 to 25 years for the long term. Although some use adjustments would occur in the short term, the majority of the adjustments would occur in the long term. In Table S-1 (located in the Summary section of this EIS) the long-term effects on vegetation production and condition are compared for the Proposed Action and alternatives.

Where rangeland productivity and condition has been reduced by overgrazing, the proposed management actions (generally in the Category I allotments) could cause an improvement in the following ways:

1. Grazing treatments could be used to improve range condition through total rest or spring rest. The adverse effects of spring grazing could be reduced or eliminated by implementing grazing treatments that alternate or defer use during this critical plant growth and reproduction period (Hormay, 1970). This would provide rest to the vegetation and thereby improve vegetation composition and diversity, increase production, and improve condition and trend.
2. Adjusted turnout dates based on range readiness could be used to avoid any permanent damage to vegetation or soil. Grazing would be delayed until the soil was firm enough that the livestock would not cause severe soil compaction. Severe compaction of wet soil results in reduced moisture infiltration from precipitation, and reduces air supply to roots and germinating seeds. This problem is more evident with heavier soils along streams, in meadows, and on steeper slopes. Grazing would also be delayed until key forage plants began to store food in their roots (Stoddard, Smith, and Box, 1975).
3. The development of water and the construction of fences to improve the distribution of livestock over the entire area could be used to promote a more even utilization of forage. Proper utilization of the forage is important in maintaining or improving the vegetative vigor, production, and range condition. Properly placed water developments, combined with grazing systems, would cause the livestock to move from the overused existing water sources, allowing these areas to improve in vigor and production. Although the vegetation around these improvements would be adversely affected, the overall impact to vegetation under this alternative would be beneficial because of better distribution of livestock.
4. The spraying of sagebrush by aerial application of a herbicide could be used to modify vegetative types. The exact amounts of change in composition from sagebrush-grass to grasses and forbs cannot be predicted because of variation in the range sites. However, spraying has produced a reduction in big sagebrush ranging from 67 to 100 percent (Blaisdell and Mueggler, 1956). Prescribed burning of sagebrush in one experiment (Pechanec, Stewart, and Blaisdell, 1954) produced a 90 percent increase in grasses and forbs.
5. Fencing could be used to exclude livestock from some riparian areas. Within 4 years after completion of the fencing, there would probably be marked improvement in the condition of riparian vegetation (Hormay, 1970; Duff, 1979). The improvement would show an increased number of cottonwood and willow saplings and improvement in streambank condition.

Proposed Action

Production. In the short term, vegetation production would continue at the present levels as shown in Table 2-7 in the Vegetation section of Chapter 2 of this EIS. In the long term, vegetative production on many allotments would be increased by the proposed management actions. The expected long-term increases in vegetation production would be in the upper portion of the ranges shown in Table 2-7. Specific quantification is not possible because of the uncertainty of vegetation response to management actions.

Condition and Trend. Changes in the proposed levels of use, implementation of grazing treatments, and vegetation modification each affect range condition and trend. The exact amounts of change in range condition and trend cannot be predicted because of the variation in response to these factors on different range sites. Therefore, the combined effects of these changes on vegetation are assessed in this analysis.

As the utilization of vegetation under the Proposed Action was reduced, plant vigor would improve and promote key plant growth and reproduction. In addition to reducing the degree of utilization of vegetation in the EIS area, grazing treatments in conjunction with proposed vegetation modification and support facilities (water troughs, spring developments, etc.) would improve vegetation condition in the EIS area.

Declining trend would be reversed as a result of improved plant vigor and accelerated growth and reproduction. This, in turn, would improve range conditions over a 25-year period. The riparian vegetation would improve at a more rapid rate. All ranges currently in good condition would remain in good condition.

Threatened or Endangered Plant Species. Meadow pussytoes occurs in moist meadow areas. According to Lichvar (oral commun., 1982), current grazing has reduced the number of meadow pussytoes plants in these areas. Under the Proposed Action, some of these areas would be fenced. In those areas, meadow pussytoes should increase. In all other areas, overgrazing would continue and this species would continue to be reduced.

Conclusions. In the Category M allotments, the range would probably remain in satisfactory condition or improve. The Category C allotments would probably not decline, and after regrouping, exchanging, or selling them, they would probably improve. In the Category I allotments, there would continue to be a decline in condition and trend and overuse of certain areas, especially the meadow and riparian habitats, for the short term. Other areas, which are in satisfactory condition, would remain so. Upward trends would continue upward. Range condition, trend, and productivity would improve over the entire EIS area in the long term.

Elimination of Livestock Grazing

Production. Complete rest from livestock grazing would cause an improvement in vegetation production in those areas currently being overused. Under this alternative, there would be more grazing on browse and forb species by big game, thus reducing use on grasses. Wild horse increases would cause some increased use on grasses. However, the area would eventually reach its climax condition. Meadow/riparian areas would have more shrubs and increases in grass production, and upland sites would show mostly increases in grasses (Holmgren, 1976). Table 2-7 in the Vegetation section of Chapter 2 of this EIS shows the potential climax production that could occur in the long term.

Condition and Trend. Complete elimination of livestock grazing would result in an improvement in range condition and trend. The amount of improvement in condition would depend largely on the vegetation type and its present condition. Areas in poor condition would show a minor improvement in condition and a trend toward the climax vegetative community in the short term. Areas in fair and good condition would respond much more quickly. The greater the adverse impact that grazing has had on the existing vegetation, the slower the improvement would be from the elimination of livestock grazing. Increases in diversity of species and cover would also depend on past livestock use. According to Fisser and Ries (1974), an estimated 2 percent increase in cover would occur over the long term. Areas of low use would show slight increases, but vegetation types would not change. Changes in vegetation occur very slowly in the EIS area, which has predominantly poor soils and harsh climatic conditions (Stoddard, Smith, and Box, 1975).

There would not be concentrations of livestock on meadows and riparian areas. The vegetation would respond by increased production and vigor in a short-term period.

Threatened or Endangered Plant Species. Meadow pussytoes should benefit by this alternative.

Conclusions. Implementation of this alternative would be beneficial to vegetation in the EIS area. Vegetation production would increase, range condition would improve, and trend would be upward. Browse species would decline and grasses would increase.

Enhanced Livestock Grazing

Production. Reducing the level of wild horse and big game use would improve the range vegetation sufficiently so that livestock use could be increased in the long term. The magnitude of change in production directly attributable to the proposed reduction in wild horse and wildlife vegetation use would remain unknown until after monitoring. The proposed proportion of livestock to wild horses and big game use would cause some changes in vegetation production in the long term. Greater utilization would be made of grass and less of browse (Hormay, 1970). This would have the opposite effect of the Elimination of Livestock Grazing alternative and would favor browse and forbs over perennial grass species (Harper, 1969). This change in production would be, in part, due to the change in level of livestock use and would be expected to be in the middle portion of the ranges shown in Table 2-7 in the Vegetation section of Chapter 2 of this EIS.

The proposed grazing treatments would provide rest to vegetation during critical growth periods. This would improve vegetation production and diversity. The magnitude of change in vegetation production directly attributable to the proposed grazing treatments is unknown.

Condition and Trend. Changes in the proposed level of use, grazing treatments, and vegetation

modifications, each affect range condition and trend. Reduced levels of utilization on vegetation under this alternative would improve plant vigor and promote increased key plant growth and reproduction. The reduction in use and implementation of grazing treatments, in conjunction with vegetation modification and support facilities (water troughs, spring developments, etc.), would improve the range condition in the long term. Declining trend would be reversed as a result of improved plant vigor, change in composition, and accelerated growth and reproduction. This, in turn, would improve range condition over a 25-year period. All range currently in good condition would remain in good condition.

Under this alternative, it would be necessary to fence the meadow/riparian habitat to prevent overuse. If this habitat were fenced, it would increase in production and improve in plant species composition. The current condition would begin to improve; however, all unfenced areas would continue to deteriorate.

Threatened or Endangered Plant Species. Monitoring would be necessary to assess the exact impacts of even light grazing on meadow pussytoes.

Conclusions. Implementation of this alternative would be beneficial to vegetation on about 98 percent of the EIS area in the long term. Vegetation production would increase, and range condition and trend would improve. On the remaining 1.5 percent, which is the riparian vegetation, the vegetation would continue to deteriorate, and production would continue at its present reduced level.

No Action

Production. There would be a decline in vegetation production in those areas where overgrazing is a problem.

Condition and Trend. Under this alternative, the present vegetation trends would continue. However, some areas are in poor condition with declining trend. In these areas, the necessary annual storage of nutrients would not be achieved (Martin, 1978). Areas now in an upward trend would continue upward under this alternative. Areas with a static trend would remain static, and areas with declining trend would continue to decline. There would be a decline in range condition in those areas where overgrazing is a problem.

The meadow and riparian habitats are estimated to be in poor condition and declining. Meadows and riparian habitats heavily used by livestock would continue to show a decrease in production, cover, and diversity of species and a decline in plant vigor. The more desirable forage would be replaced by less desirable plants.

Threatened or Endangered Plant Species. The current impacts on meadow pussytoes, as discussed in the Proposed Action, would continue. Monitoring of meadow pussytoes would be necessary to analyze the significance of these impacts.

Conclusions. Under this alternative, the present static or improving trends would continue, with the majority of the area remaining in fair to low-good condition. Current utilization would cause a reduction in vegetative production and plant composition diversity in areas of overuse. The existing trend would continue, and the condition class of some areas could decline. Meadow and riparian habitats, which are estimated to be in poor condition and declining, would continue to decline.

Management Based on Currently Available Forage Data

Production. Overuse is a problem in the EIS area. Reducing the degree of average annual overuse of key plant species would improve plant vigor. Under this alternative, the vegetation in the EIS area would respond gradually to the proposed reduction in average annual use. Improvement in plant vigor would be the first result of the proposed changes and would be an important factor in improving range condition and trend (Weaver and Darland, 1947; Pechanec, Stewart, and Blaisdell, 1954; Short and Woolfolk, 1956). As the vigor of the perennial grasses and shrubs improved, more seed would be produced and more seedlings established. Under this alternative, reduced livestock use would, in the long term, result in some change in vegetation composition. The change would be toward more perennial grass, fewer undesirable shrubs and forbs, and greater diversity of species. The improvements in plant vigor and reproduction due to the reductions in use would have a positive effect on range condition and vegetation production. The effect would be area wide, with measureable increases in vegetation production continuing until good condition was reached. The expected long-term increases in vegetation production would be in the upper portion of the ranges shown in Table 2-7 in the Vegetation section of Chapter 2 of this EIS.

Condition and Trend. Impacts on range condition and trend under this alternative would be the same as for the Proposed Action, but could occur more rapidly.

Threatened or Endangered Plant Species. Impacts to meadow pussytoes would be the same as for the Proposed Action, but could occur more rapidly.

Conclusions. Implementation of this alternative would have similar impacts to those described for the Proposed Action, but they could occur more rapidly.

Socioeconomics

General Information and Assumptions

In this section, the Proposed Action and alternatives will be analyzed for their impacts to the local, regional, and national economy. The analysis will cover four types of impacts: direct, indirect, related, and social. Direct impacts deal specifically with the livestock industry. Indirect impacts are those that would affect the regional economy (Carbon and Fremont counties). Related impacts cover the economic effects on wildlife and wild horse concerns. Social impacts deal with lifestyles and attitudes. In Table S-1 (located in the Summary section of this EIS) the long-term effects on socioeconomics are compared for the Proposed Action and alternatives.

The livestock industry would experience the full direct impacts of any changes in allotment use. The intensity of the impact to an individual operation would be consistent with the dependency of the operation on public land for its economic viability. Impacts to the livestock industry will be analyzed based on 1979 data which has been updated with 1981 figures.

The indirect impacts will be pertinent to employment in the support activities, regional income, population, and general economic well-being. They will be analyzed through the use of an input-output (I/O) model developed for south-central Wyoming (McKean and Weber, 1981). Although the region characterized by this model includes only Carbon, Albany, and Sweetwater counties, Fremont County is assumed to be similar enough in sector composition to allow use of the multipliers brought forth in the model.

Both direct and indirect impacts will be assessed based on an average-sized ranch (1,462 AUs) characteristic of the area. The impacts could be more or less than estimated, depending on the size of the operation, its dependency on public land, and the percentage of M, I, and C category allotments on that public land.

Only one of the three sheep operators in the EIS area volunteered to provide information for this analysis; therefore, it is impossible to exclusively analyze the sheep industry in the EIS area without disclosing confidential information. Given this constraint, sheep operations will be included under the general heading of livestock in the analysis in this section.

The analysis in this section is based on the following assumptions:

1. Private or other AUMs and on-ranch hay production would be in fixed supply or otherwise unavailable.
2. The average operator would have proportional percentages of each allotment category, i.e., 54 percent Category I, 26 percent Category C, and 20 percent Category M.
3. The operator must use all of his AUMs.
4. The operator would have two options available to him to meet reductions in AUMs:

   Option 1. He could purchase additional hay to supplement loss of licensed AUMs.

   Option 2. He could reduce his herd size to meet existing forage supplies.

Proposed Action

In this analysis of the effects of the Proposed Action, the short term is defined as ranging from the completion of monitoring and management action implementation to the point when range conditions start improving. The long term extends from that point to approximately 20 years after implementation. The analysis is made on a worst-case basis.

Direct Impacts. Following is an analysis of the direct impacts of the Proposed Action on I, M, and C category allotments and on an average ranch.

Category I Allotments. In Category I allotments, short-term adverse impacts similar to those affecting current use might continue for the period in which monitoring studies were being implemented and decisions made. Long-term monitoring on these allotments could show the need for exclusion of livestock in areas that are receiving heavy use. Total exclusion of livestock from some areas might be required to improve range condition. If exclusions or reductions in livestock were required after monitoring studies were completed, temporary hardships would be experienced by some operators who would be forced to reduce their herd size or

purchase additional AUMs of forage from outside sources.

Some of the operators in the EIS area would be inconvenienced by varying turnout dates, because advance commitments must sometimes be made as to the exact number and date of delivery for livestock shipments. Delivery dates of livestock trucked in from other areas could not be made until a turnout date was established.

Since BLM's manpower and funds would be expended in the highest priority allotments first, other Category I allotments could continue to deteriorate, which could result in the need for more severe corrective measures later. Larger reductions in herd size and more radical management actions (later turnout dates) might be necessary to resolve the conflicts in these lower priority allotments. Operators might have to take a bigger cut in grazing preference to resolve the conflicts in these lower priority allotments.

Grazing treatments to be established in the Category I allotments might temporarily exclude some areas from grazing, thereby causing operators to shift livestock to other areas or reduce herd sizes. Areas that would be sprayed for sagebrush or burned to increase grass and forb production would have to be rested for a period of time to establish desired plants. Other sources of forage or reduction in herd size would be required of the operator during this time.

Category M Allotments. In the Category M allotments, there would be very little or no impact on livestock operators in the short term. Livestock numbers would probably remain the same or increase. Since these allotments are listed in good condition, very few reductions would be expected to occur. In the long term, operators might benefit from increased forage for livestock grazing and increased flexibility in methods of operation.

Category C Allotments. Livestock operators with Category C allotments would experience many of the same impacts as those for Category M allotments. However, increases in forage available for livestock would probably not occur in this category. Operators might be adversely affected if Category C lands were altered by changes in fence locations, land exchanges, or elimination of parcels by public sale.

Average Ranch. The short-term impacts to an average ranch are outlined in Table 3-1. In all likelihood, an operator would elect to choose some combination of the two options or consider the possibility of purchasing or leasing other AUMs. The possible combinations are too numerous to discuss in this document.

Assuming that the operator would choose the least costly method for meeting the reduced forage supply, the adverse impacts to the individual operator would be minimal because of the time frame involved in implementing the management actions. Operators would have the option to adjust gradually over a period of time, thus minimizing losses. The long-term impacts to the ranch economy are shown in Figure 3-1.

Indirect Impacts. The impacts to the regional economy would be minimal from the Proposed Action in either the short or long term. Any losses in regional employment or revenues in the short term would be offset from the gains which could result in the long term. Through long-term increases in AUMs available in Category I allotments, Government revenues might increase as well.

Related Impacts. Wildlife species, both game and nongame, would be expected to increase in the long term from increased forage production. (See the Wildlife section of this chapter.) In economic terms, this increase in wildlife populations would represent an increase in hunter revenues, both to the state and the communities. No data are available to indicate the exact amount of increase in user days.

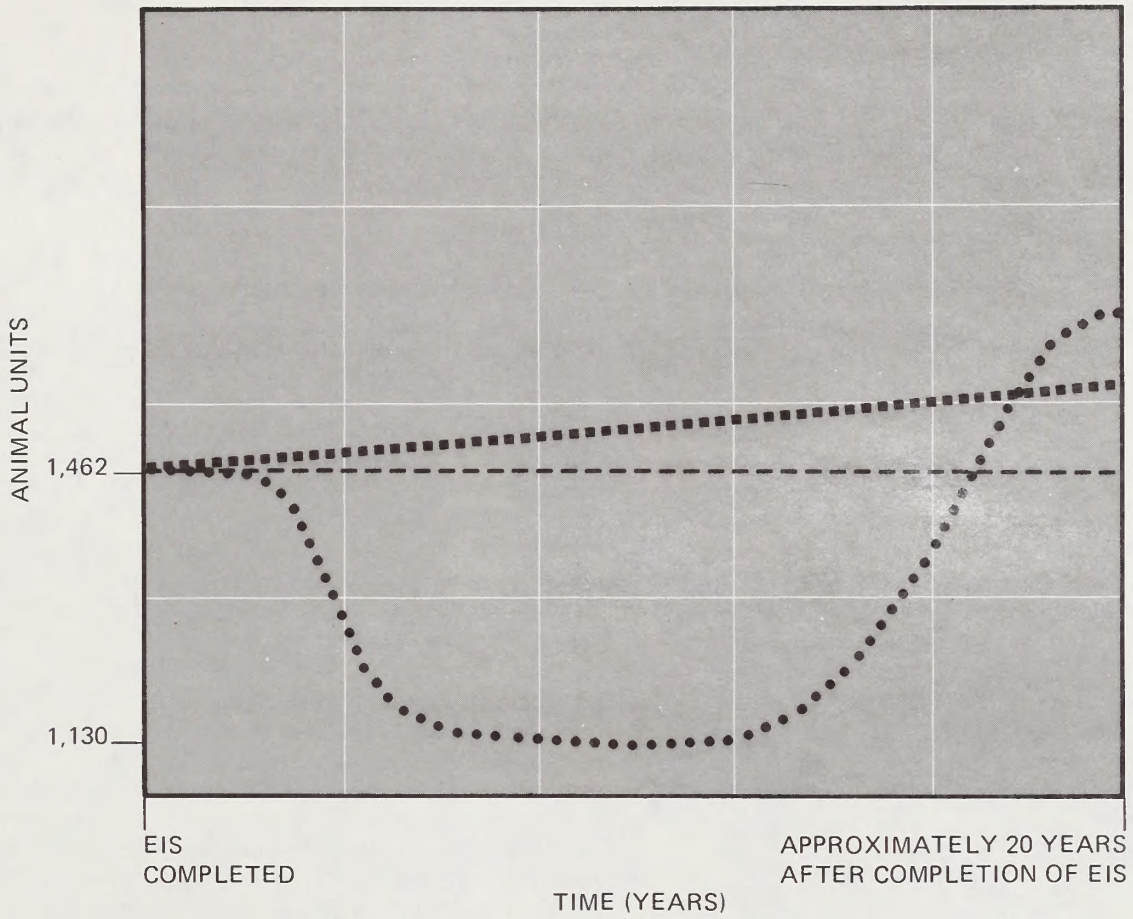
Many individuals derive an unquantifiable aesthetic value from seeing wildlife and wild horses on the plains of Wyoming. Forage competition between livestock, wildlife, and wild horses currently exists; therefore, wild horse populations might be reduced. If a reduction did become necessary, the aesthetic value of wild horses would be reduced accordingly.

Social Impacts. The overall social effects of the Proposed Action would be minimal. Regional lifestyles and attitudes would be altered very little, because most ranchers would continue operations much as they have before. It is expected that this action would change the historical pattern of this area very little.

Elimination of Livestock Grazing

For purposes of analysis of the effects of this alternative, the short term is defined as the first 5 years after implementation of management decisions. Long-term impacts would occur from that point to approximately 20 years after implementation. The analysis is made on a probable-case basis.

Direct Impacts. Eliminating livestock use from all federal lands within the EIS area would not have a significant adverse impact on the national livestock industry. However, it would cause local hardships and substantial increases in operational costs.



NOTE: This graph is based on the assumption that available forage on Category I lands would increase over the long-term resulting in an increase in the number of AUs the range could support. In the short-term, the average ranch would experience a decline in AUs while management actions were implemented and range condition was improving. In the long-term, AUs would be expected to increase.

Figure 3-1
ESTIMATED LONG-TERM IMPACTS TO A 1,462 AU RANCH UNDER THE PROPOSED ACTION

Livestock operators' dependency on other lands would increase if they elected to stay in the livestock business. Herding would be required to move sheep and cattle to leased private or state lands, and this leased property would have to be fenced to prevent livestock from straying onto federal land.

Some operators would be affected less than others, but many would be forced to purchase higher quality bulls and replacement heifers to improve the efficiency of their operations or be forced to seek additional sources of income. Table 3-2 outlines the impacts this alternative would have on an average ranch.

Indirect Impacts. The impacts to the regional economy from the use of Option 1 would be substantial. The I/O model indicates there would be a loss of employment to 417 people (36 percent of the employment associated with the livestock sector in Carbon and Fremont counties) and a significant decline in ranch numbers due to long-term losses of revenues. Option 2 would lessen the effects, yet losses would still prevail to the regional economy. Table 3-3 shows the indirect impacts to the regional economy.

An additional impact would be the loss of tax revenues to the affected counties. This impact would be slight, however, because the agricultural sector only contributes .08 percent of the total sales tax revenues in Carbon County and .12 percent in Fremont County.

Related Impacts. An important economic consideration under this alternative relates to wildlife values. The elimination of cattle from public lands in this area would lead to more stabilized wildlife populations, and important economic returns would be realized from hunting revenues. Although no specific data are available for this area regarding number of angler or hunter days, recreation expenditures would be expected to stabilize or increase to correlate with stabilization or increases in game species populations. (See the Wildlife section of this chapter.) Society would also gain benefit from the knowledge that wildlife and wild horse populations would increase, become more visible, and contribute to the open, free plains characteristic of Wyoming.

Social Impacts. In a region that is predominantly agrarian, this alternative would present significant social impacts serious enough to upset the traditional ranching lifestyle.

Enhanced Livestock Grazing

For purposes of analysis of the effects of this alternative, the short term and long term are defined as being similar to those described for the Elimination of Livestock Grazing alternative. The analysis is made on a best-case basis.

Direct Impacts. The emphasis on forage production for domestic livestock use under this alternative would benefit the livestock operators in the EIS area. Once AMPs were completed and grazing systems applied to the area, livestock numbers would be expected to increase.

In the short term, some livestock operators would experience a slight decline in available AUMs, due to implementation of the management proposals. This situation would change as range and forage yields were increased and sufficient production improvements were made. There would be an upward trend in positive economic returns in the long term until the range reached its full potential, at which point positive returns would level off. Short term impacts might be similar to those indicated for the Proposed Action, and short-term losses would be moderated by the gains experienced in the long term. An analysis of the short-term impacts to an average ranch under this alternative is outlined in Table 3-4. The only option considered in this analysis is that of increasing the herd size, which is assumed to be the operator's choice. The analysis is a hypothetical, idealistic case. Increases in net revenue are based solely on the assumption that the additional forage would immediately be available to livestock.

Indirect Impacts. The regional economy would probably experience little change in employment, income, or population due to the short-term impacts of this alternative. Long-term regional economic conditions would show little change directly attributable to the livestock industry.

Related Impacts. Long-term impacts would occur due to the loss of revenues from recreation, specifically hunting. Revenue losses would be equal to the expenditure per day (as identified in Table 2-12 in the Socioeconomics section in Chapter 2 of this EIS), multiplied by the number of user days lost in the EIS area as a result of wildlife migration or losses. Estimates of user days are not available at this time. This alternative would also pose hardships for wildlife and wild horses, causing a long-term decline in their populations and ultimately reducing their visibility to society.

TABLE 3-1

SHORT-TERM IMPACTS TO AN AVERAGE RANCH UNDER THE PROPOSED ACTION

Option 1: Operator must purchase additional hay to supplement loss of licensed AUMS.

Current Hay Purchases	Future Hay Purchases[1/]
1,454 AUMs	5,175 AUMs

Change in Net Revenue: -$100,113
Percentage Change in Net Revenue: -208.46

Option 2: Operator must reduce his herd size to meet existing forage supplies.

Current Herd Size	Future Herd Size[2/]
1,462 AUs	1,130 AUs

Change in Net Revenue: -$7,622
Percentage Change in Net Revenue: -17.36

1/ Represents the change in hay AUMs necessary to support the present herd size.
2/ Estimates were calculated using average forage requirements per AU.

TABLE 3-2

IMPACTS TO AN AVERAGE RANCH UNDER
THE ELIMINATION OF LIVESTOCK GRAZING ALTERNATIVE

Option 1: Operator must purchase additional hay to supplement loss of licensed AUMS.

Current Hay Purchases	Future Hay Purchases[1/]
1,454 AUMs	6,890 AUMs

Change in Net Revenue: -$185,373
Percentage Change in Net Revenue: -422.25

Option 2: Operator must reduce his herd size to meet existing forage supplies.

Current Herd Size	Future Herd Size[2/]
1,462 AUs	848 AUs

Change in Net Revenue: -$17,150
Percentage Change in Net Revenue: -39.06

1/ Represents the change in hay AUMs necessary to support the present herd size.
2/ Estimates were calculated using average forage requirements per AU.

TABLE 3-3

INDIRECT IMPACTS TO THE REGIONAL ECONOMY UNDER THE ELIMINATION OF LIVESTOCK GRAZING ALTERNATIVE

	Employment[1] (people)	Income (dollars)	Population[2] (people)
Option 1: Operators must purchase additional hay to supplement loss of licensed AUMS.	-417	-55,505,125.00	-1,197
Option 2: Operators must reduce herd size to meet existing forage supplies.	-88	- 5,135,122.00	-253

[1] Represents direct, indirect, and induced employment.
[2] This change is calculated using 2.87 persons per household as an average for the EIS area.

TABLE 3-4

SHORT-TERM IMPACTS TO AN AVERAGE RANCH UNDER THE ENHANCED LIVESTOCK GRAZING ALTERNATIVE

Current Herd Size	Future Herd Size[2]
1,462 AUs	1,975 AUs
Change in Net Revenue: +$15,303	
Percentage Change in Net Revenue: 34.85	

[1] Estimates were calculated using average forage requirements per AU.

Social Impacts. From a social standpoint, this alternative would enhance the ranchers' social well being, stabilize his existence in the long term, and preserve the ranching tradition.

No Action

For purposes of analysis of the effects of this alternative, the short term is assumed to be the next 5 years, and the long term extends to approximately 20 years beyond that. The analysis is made on a probable-case basis.

Direct Impacts. Under this alternative, allotments in good condition would be expected to remain in good condition. Allotments that are improving in condition would continue to improve, and livestock would benefit as well.

Allotments in poorer condition and showing a downward trend would continue to deteriorate. Livestock production in these allotments would decrease accordingly. In the most severe cases, undesirable and noxious plants would increase, causing health problems in livestock herds. Voluntary reductions in herd size and decreasing reproduction rates would occur as the range deteriorated. There are very few allotments that fall into this category. Conditions on these allotments could be improved if operators in the area participated in voluntary nonuse.

The direct impacts to the rancher under this alternative are difficult to measure, because no specific cuts have been proposed for individual allotments at this time. Livestock operators would be expected to continue operations as they have in the past, although current forage data indicates demand exceeds supply. If this trend continued, operators would have to reduce herd sizes or obtain supplemental AUMs from outside sources. Such actions would reduce ranch revenues, and some operators would be required to seek sources of supplemental income. The EIS area operators might become unable to compete economically with other livestock enterprises in the state, because relative prices paid and received by the operators would reduce their viability in the market place. If this situation were to persist, the area could see a decrease in the number of livestock operations.

Indirect Impacts. The regional impacts from this alternative would be minor in the short term; however, in the long term, the economy could be moderately affected. If area ranch incomes were reduced, the number of hired hands would be reduced as well, possibly adding to the state's unemployment rate if these displaced workers were unable to find jobs. Regional incomes associated with the livestock sector would decline also, reducing the government revenues generated from that sector.

Related Impacts. The impacts to wildlife and wild horse populations would follow much the same pattern as those to livestock. As the amount of available forage on public lands declined, populations would migrate to other areas or otherwise decline. This would affect the revenues generated to communities and the state from recreation expenditures.

Social Impacts. The social impacts from this alternative would probably be minor, with little change from the existing situation.

Management Based on Currently Available Forage Data

In this analysis, the short term is defined as ranging from implementation of management actions to the point when range conditions started improving. The long term extends to approximately 20 years beyond that point. This analysis is made on a worst-case basis.

Direct Impacts. The impacts of adopting this alternative would be much the same as those identified for the Proposed Action, except that the adjustments in livestock numbers would occur sooner causing more severe inconveniences to livestock operators in the short term.

If livestock use were terminated in some allotments, the impacts to affected operators would be the same as for the Elimination of Livestock Grazing alternative. Reduction of a lesser degree would also have an adverse effect on livestock operators. The magnitude of the impact would depend on how much the operator relied on licensed AUMs.

Long-term effects would be similar to those identified for the Proposed Action.

Other Impacts. The indirect, related, and social impacts would be similar to those identified for the Proposed Action.

Conclusions

Implementation of the Proposed Action or any of the alternatives would have relatively slight regional impacts, because the agricultural/livestock sector does not employ many external workers. Many ranches are operated by owners and assisted by family labor. From a social aspect, however, agri-

culture plays a major role in the area. Livestock ranching has been a traditional lifestyle and to upset that position would have many long-term effects.

With regard to socioeconomic impacts, the Proposed Action would be the best management option, because adverse impacts would be moderated in the long term, and multiple-use objectives would be served. The least optimal alternative would be the Elimination of Livestock Grazing alternative, which would have a substantial negative impact on the area's economy.

Wildlife

General Information

In Table S-1 (located in the Summary section of this EIS), the long-term effects on wildlife are compared, by species, for the Proposed Action and alternatives. Impacts to chukar partridge, Hungarian partridge, and threatened or endangered wildlife species are not analyzed in this section. It is anticipated that neither species of partridge would be significantly affected by the Proposed Action or alternatives. Generally, chukars are not adversely affected by livestock grazing, and most Hungarian partridge habitat in the EIS area is on private land. A biological assessment of endangered species in relation to the Proposed Action and alternatives is being prepared and will be completed before the final EIS is issued. It is anticipated that none of the endangered species would be affected by the Proposed Action or alternatives.

Proposed Action

Assumptions. The assumptions used in development of the wildlife impact analysis for the Proposed Action are:

1. The short-term time frame lasts until 6 years from the date the final EIS is published, when the effects of proposed management actions on wildlife habitat would become evident.
2. The long-term time frame is 6 to 25 years from the date the final EIS is published.
3. No alternative management actions that intensify forage competition among livestock, wildlife, and wild horses would be implemented.

Category I Allotments. Following is an analysis of the effects of the Proposed Action on wildlife habitat in Category I allotments.

Nongame Wildlife. In the short term, nongame wildlife habitat condition would remain below potential on Category I allotments. With habitat condition below potential, existing populations would be more subject to the effects of climate, and wide fluctuations in population size from year to year could be expected for some species.

In the long term, nongame wildlife habitat would be likely to improve on areas excluded from livestock grazing and on allotments placed under grazing systems. Remaining nongame wildlife habitat in the EIS area would not be likely to improve.

Dramatic improvement would be evident on riparian habitat types excluded from livestock grazing. Here, vegetative structure and plant species diversity would increase to maximum potential, resulting in excellent habitat condition. An exclosure study conducted in Utah (Duff, 1979) showed that after a 4-year rest from livestock grazing, small mammal, songbird, and raptor use and diversity in the exclosure increased 350 percent compared to outside, grazed areas.

Within those areas where grazing systems would be implemented and no exclosures constructed, improvement of riparian habitat types would depend on the design of the grazing system. Myers (1981), in a study of grazing systems and riparian habitat in southwestern Montana, concluded that livestock use is compatible with management of riparian habitat on some streams if grazing systems are properly designed. Grazing systems most likely to improve riparian habitat are those which limit the duration and frequency of livestock use during dry, hot summer months.

Improvement of habitat condition would be followed by increases in the abundance and species diversity of nongame wildlife. Improved habitat condition would also enhance population stability for many species by diminishing the effects of climate on population size. Increased abundance, species diversity, and population stability of small nongame species would also provide a more stable prey base for predators.

Small Game Mammals. Small game mammals would be affected under the Proposed Action in the same way as nongame wildlife.

Big Game Ungulates. In the short term, competition for available forage between grazing animals would continue, and the condition of big game habitat on Category I allotments would either remain unchanged, or gradually deteriorate. In the long term, it is anticipated that the condition of big game habitat would improve on most Category I allotments.

As livestock and wild horse use was adjusted, either through a redistribution of grazing pressure

or by reducing numbers, forage competition between grazing animals would be reduced, and the availability of forage for big game would increase. Adjustment of turnout dates would help increase forage availability for big game during early spring. The nutritional needs of wild ungulates are very high at this time and substantial quantities of green plants are required (Mackie, 1978). Adequate nutrition is an important factor in the birth and survival of young animals.

Implementation of grazing systems would help improve the condition of big game habitat in some cases. In order to achieve specific objectives for improving habitat condition on particular sites, various grazing treatments involving rest, deferment, or other seasonal grazing restrictions could be incorporated into the design of the grazing system.

Habitat suitable for use by elk, mule deer, and antelope might be made available through the reclamation of areas disturbed by energy and mineral activities. Restoring these areas to a suitable habitat condition would require establishing vegetative species preferred by these animals for cover and forage.

Fall and winter livestock grazing might prevent significant improvement of habitat condition on some antelope and mule deer winter ranges. Browse species essential to wintering antelope and mule deer are most palatable to grazing animals during the fall and winter seasons. Use of browse by livestock and wild horses is greatest during this period. Furthermore, when preferred grasses are unavailable because of deep snow or past overgrazing, both livestock and wild horses use browse extensively. Under these circumstances, the condition of winter range habitat would not be likely to improve.

Range improvement projects would have highly variable effects on big game habitat. It is not presently possible to provide a detailed impact analysis on each of these projects because their final design, location, size, etc., have not been determined. Nevertheless, the general effects of some improvement projects are discussed below.

Water developments located on big game winter ranges would lead to concentrated grazing pressure and reduced availability of winter forage on these ranges. Water developments located away from important winter ranges might lead to lighter grazing pressure and increased availability of winter forage on these ranges. On marginal habitat areas where lack of water limits use by antelope or mule deer, new water developments would increase the availability of suitable habitat and improve the distribution of existing populations.

New fences would help provide better livestock distribution on many important big game ranges in the EIS area, thereby increasing the availability of forage and cover on some areas that are presently overgrazed. Nevertheless, new fences would restrict the movements of antelope, mule deer, and bighorn sheep to various degrees. Antelope would be adversely affected more than any other species, especially during late fall and winter when they were moving toward winter ranges. Where herds were migrating, fences would cause considerable mortality during severe winters when snowfall was greater than 4 inches (Seven Lakes Grazing Environmental Statement). New fences on mule deer yearlong and winter ranges might increase deer mortality in some cases, but it is likely that this impact could be offset by fence design and by the beneficial effects of controlling livestock use on important deer ranges. The need for new fencing would be minimal on bighorn sheep ranges in the EIS area. It is anticipated that any adverse effects from new fencing on bighorn sheep ranges would be offset by the beneficial effects of better livestock distribution. Any adverse effects of new fences on elk and moose would probably not be significant.

Vegetation manipulation projects would adversely affect habitat condition if the availability of forage or cover were reduced on big game ranges. Projects undertaken on winter ranges or on calving and lambing areas would have the greatest potential to adversely affect big game habitat. For example, reducing browse or forbs on dry areas of summer range where antelope densities are low would have little effect on overall antelope habitat condition; whereas, any reduction of browse on crucial winter ranges might result in significant winter mortality. In some cases, however, projects could be located and designed to increase the availability and quality of forage and cover. On elk and bighorn sheep ranges, projects designed to increase forage for cattle might enhance habitat condition for elk and sheep because of the similar forage preferences of these species. Specific treatment methods such as prescribed burning might enhance forage quality for mule deer on winter ranges. On summer ranges and some areas of yearlong range, habitat condition would be enhanced if the treatment method increased the proportion of forbs in the composition of the vegetation. On moose ranges, habitat condition might be improved by designing projects to promote the regeneration of cottonwood, aspen, and willow vegetation, which would provide additional food and cover for moose.

Game Birds. It is anticipated that sage grouse habitat would improve slightly under the Proposed Action. On important brood-rearing areas such as the riparian habitat types, construction of livestock

exclosures and implementation of grazing systems might increase the availability of succulent forage and protective cover. In allotments with strutting/nesting complexes, there would be a reduced probability of nest trampling if livestock numbers were reduced. Increasing livestock numbers, however, would increase the probability of nest destruction.

Since sage grouse are usually found near water, new water developments might increase the availability of suitable sage grouse habitat. The availability of suitable habitat would be reduced, however, if vegetative manipulation projects were used to remove sagebrush cover, especially if such projects were undertaken on sage grouse winter ranges or strutting/nesting complexes. The proposed reclamation of disturbed areas would increase the availability of suitable sage grouse habitat if stands of big sagebrush were reestablished.

Blue and ruffed grouse habitat would also be likely to improve under the Proposed Action. Overgrazing and trampling of herbaceous understory vegetation would be reduced along forest edges, thereby improving the quality of nesting and brood-rearing habitat for these species. However, any reduction of shrub cover in these areas due to vegetative manipulation projects might reduce habitat quality.

Wetland-riparian habitat used by waterfowl would not improve significantly on Category I allotments, except in some small areas where livestock exclosures were constructed. In some cases, stockwater development might result in the creation of new waterfowl habitat areas.

Mourning dove habitat would not improve significantly under the Proposed Action. Adjustments in the levels of grazing animals, however, might reduce the probability of nest trampling.

Conclusions. The Proposed Action would generally improve wildlife habitat on Category I allotments, thereby enhancing the survival and productivity of many wildlife species. Improved habitat condition on winter ranges would lead to reduced mortality during severe winter weather. Improved habitat condition on yearlong and summer ranges would also promote winter survival, because animals could complete growth requirements and build up winter fat reserves. Greater availability of forage and cover during early spring would enhance reproductive success. Enhanced survival and productivity would lead to greater year-to-year population stability for many species.

Category M Allotments. The condition of wetland and riparian habitat types on Category M allotments would remain below potential, except where exclosures were constructed. In addition, the various potential effects of range improvement projects on wildlife habitat discussed above for Category I allotments would apply to Category M allotments. There would be no other significant adverse impacts on wildlife habitat in Category M allotments under the Proposed Action.

Category C Allotments. Where fence locations were changed, shifting habitat on Category C allotments into Category M and Category I allotments, impacts on wildlife habitat and populations would be subject to the same impacts as for the Category M or I allotments. Where land exchanges were made, adverse or beneficial effects on wildlife would depend on the location and habitat value of the land involved in the exchange. In some cases, exchanges might provide for intensive management capability on formerly private lands. Habitat on private lands transferred to federal ownership would be subject to the same impacts as habitat in Category I and Category M allotments. On the other hand, if federal lands containing important wildlife habitat values were transferred out of federal ownership, the potential for improving wildlife habitat condition might be lost and wildlife populations might be adversely affected. The effects of public sales would be the same as described for the transfer of habitat out of public ownership.

Elimination of Livestock Grazing

Wildlife habitat condition would improve substantially under this alternative. Elimination of competition between wildlife and livestock on public lands would increase the availability of food and cover for most wildlife species. Habitat improvement might be limited, however, on some areas of elk, antelope, and mule deer winter ranges because of greater numbers of wild horses. Nevertheless, it is anticipated that adequate food and cover would be available to support the big game populations planned by the Wyoming Game and Fish Department.

Improved habitat condition would be most evident on riparian habitat types on public land. Here extensive regeneration and reestablishment of cottonwood, aspen, and willow vegetation would take place. The abundance and species diversity of nongame wildlife would increase considerably in these areas. Excellent calving/fawning areas would be provided for moose and mule deer, and all big game ungulates would benefit from the increased availability of forage and/or cover. Game birds would benefit from substantial increases in protective brood-rearing cover, insects for food, succulent forage, and water.

If extensive fencing of private lands occurred under this alternative, it is likely that big game ungulates would be adversely affected. Such fencing might significantly restrict animal movements, resulting in heavily overgrazed concentration areas and high winter mortality.

Enhanced Livestock Grazing

This alternative would have greater adverse impacts on wildlife than any of the other alternatives. Greater use of wetland and riparian habitat types would occur, reducing the diversity of the vegetative community and the value of the habitat. Nongame wildlife abundance and species diversity would decline. Forage competition between big game and livestock would intensify. Declining habitat condition would magnify the effects of climate on wildlife populations, resulting in frequent erratic fluctuations in population sizes. The availability of harvestable animals would fluctuate accordingly. Populations of big game ungulates and game birds would probably decline substantially, and it is unlikely that big game populations could be maintained at Wyoming Game and Fish Department objective levels.

No Action

Essentially, this alternative would result in a continuation of the existing situation for wildlife. Riparian habitat types would continue to be overgrazed, and essentially all vegetative reproduction would be eliminated as soon as it became established (Davis, 1977). Consequently, the abundance and species diversity of nongame wildlife would remain below potential. Small game mammals would be similarly affected.

Big game habitat would improve slightly, if at all, on limited areas managed under new grazing systems. At best, on some small areas, habitat condition would stabilize after slight improvement. Some areas of big game habitat would continue to deteriorate as a result of competition among grazing animals for available forage. Overgrazing might indirectly contribute to disease problems among wild ungulates (Mackie, 1978). The potential for significant winter mortality among big game species would remain high due to poor habitat quality.

Nests of all game birds would be subject to a greater probability of trampling than under the Proposed Action. The condition of brood-rearing cover would remain below potential.

Management Based on Currently Available Forage Data

The effects of this alternative on wildlife habitat and populations would be similar to those for the Proposed Action, but would occur sooner.

Wild Horses

General Information and Assumptions

For purposes of this analysis, the short term is defined as occurring from the time the final EIS is published until 5 years after. The long term is open ended. In Table S-1 (located in the Summary section of this EIS), the long-term effects on wild horses are compared for the Proposed Action and alternatives.

Proposed Action

The present competition for forage and water between wild horses and other grazing animals in allotments containing wild horses (as indicated by the lack of forage shown in Appendix 2) would continue over the short term, because present management would continue during monitoring. If monitoring results indicated extreme overuse of the range, wild horse numbers would be adjusted downward to minimum viable herd levels. If monitoring results indicated very light use and increasing forage production, wild horses would be allowed to increase over the long term.

Elimination of Livestock Grazing

Under this alternative, competition for available forage, water, and space would be greatly reduced. Wild horses would not be disturbed or displaced by domestic grazing animals or related human activity. The net impact to wild horses would be improved habitat conditions and increased population to approximately 6,000 wild horses in the long term.

Under this alternative, the wild horses' natural movements generally would not be restricted, so their wild, free-roaming behavior would be preserved. The removal of some fencing on public lands would increase the size of wild horse habitat and facilitate wild horse movement. However, this alternative might also result in some state and private lands being fenced which might restrict movement of the wild horses. The wild horses would continue to exist and be viewed in a natural setting.

Enhanced Livestock Grazing

The dietary ratio between wild horses and domestic cattle is virtually one-to-one. There are several options emphasizing forage production for domestic livestock that would allow population levels of wild horses to coexist at viable numbers with livestock. Accelerated range management such as fencing and increasing livestock numbers under these options could restrict and reduce the size of existing wild horse herd areas and increase forage competition between wild horses and livestock, depending on numbers of horses managed.

The summer months are the major breeding times for wild horses. During these months, considerable mixing of bands occur. Newly erected fences would limit the mixing of the various bands, thereby increasing the possibility of genetic drift and decreasing variability within each band.

No Action

Since livestock and wild horses would remain at their present numbers, forage competition would continue at its present level. Without additional water sources, there would be increased competition for water among livestock, wild horses, wildlife, and energy drilling companies, especially over the long term as energy demands on water increased. Improved distribution and an increased number of water developments would cause the wild horse bands to become more dispersed in the short term. Areas of forage previously unavailable to wild horses because of long distances from water, would become available for grazing. However, the construction and maintenance of the various proposed range improvement projects would result in more human activity. In the long term, wild horses would become accustomed to this activity and would not be disturbed.

Management Based on Currently Available Forage Data

Under this alternative, wild horse numbers would be reduced to 447 head and would only be allowed to remain in the areas in which they were found at the time the Wild Free-Roaming Horse and Burro Act of 1971 was passed. These are essentially the same areas as the horses are found in today, with the exception of the East Beaver Creek Herd Area, where wild horses did not exist in 1971. Under this alternative, there would be decreased competition with livestock and wildlife for forage and water, which would result in improved conditions for the horses.

Fisheries

Variables and Assumptions

In order to analyze the consequences of the Proposed Action and alternatives, changes in six variables and the effects of such changes on game fish habitat were predicted. The variables are:

Variable 1. The number of miles or acres of game fish habitat under special management for improvement (i.e., under activity plans).

Variable 2. The number of wild horses on the range.

Variable 3. The number of cattle on the range.

Variable 4. The number of sheep on the range.

Variable 5. The number of stock-watering reservoirs with game fish stocking potential.

Variable 6. The number of watershed acres in good condition.

These variables could be increased or decreased by the BLM range management actions discussed in this document. These variables were selected as those which, if changed, could affect fish habitat at a level of implementation described in the Proposed Action or alternatives.

Variable 1 is the most important. With special management (e.g., temporary or permanent fencing and implementation of special grazing systems prescribed in the Green Mountain MFP), ungulate-damaged aquatic habitat could be very significantly improved. Without management specifically designed to protect and improve ungulate-damaged aquatic habitat, little could be done to upgrade these areas. Conventional grazing systems, which are tailored to upland forage plant production, have rarely been demonstrated to be beneficial to riparian and aquatic habitat condition.

Special management for aquatic habitat is usually instituted under BLM activity plans. The effect of selecting the Proposed Action or one of the alternatives on the amount of habitat under special management in the EIS area would probably be dependent on changes in the numbers and objectives of AMPs. Results of intensive monitoring studies might also lead to inclusion of some ungulate-damaged aquatic habitat under a Habitat Management Plan (HMP).

Adjustments in numbers of cattle, sheep, and wild horses could affect aquatic habitat. Minor to moderate adjustments in the numbers of cattle

alone will generally not affect the level of aquatic habitat damage, because cattle movements are uncontrolled and cattle tend to use the water's edge heavily at almost any population level. Large reductions in numbers or removal of cattle could be very beneficial to cattle-damaged aquatic habitat. Sheep movements are usually much more controlled than cattle movements, and sheep are usually directed away from the water's edge by herders. As a result, sheep tend to do less bank damage than cattle. Therefore, conversion to sheep could significantly decrease ungulate damage to aquatic habitat. Wild horses naturally tend to spend most of their time on upland range, but large reductions in wild horse populations or removal of these animals could reduce damage to banks and their vegetation and improve aquatic habitat.

Reservoirs, if constructed with fishery benefits in mind, could increase the amount of habitat present. Construction of reservoirs larger than needed for livestock watering is not currently an accepted practice; however, the positive effects of creating new fisheries on benefit-cost ratios for range improvements could result in larger reservoirs being constructed in the future. Larger reservoirs would have increased longevity, which would also improve benefit-cost ratios.

A watershed in good condition produces less stream turbidity and less siltation of stream, lake, and reservoir bottoms. Siltation and turbidity are important factors affecting the quality of game fish habitat. In addition, flooding and stream channel erosion are held to a minimum by well-vegetated watersheds. Watershed conditions affect sediment yield, which in turn affects the longevity of reservoir habitat; therefore, the better the watershed condition, the longer a reservoir can support fish. Range management actions described in this document would generally not affect the condition of entire drainages, especially large drainages, because of broken land ownership patterns. However, some actions could affect habitat through changes in watershed condition.

Since game fish habitat trends in the EIS area are unknown, for the purposes of this analysis effects are defined as follows:

1. A positive effect is:

    a. A reduction or reversal of the rate of habitat degradation.

    b. An increase in the rate of habitat improvement.

    c. The creation of new habitat.

    A positive effect does not necessarily mean that habitat quality or quantity would be increased in the future, even in habitat where livestock grazing is the only land use causing habitat degradation. The term positive effect only means improvement over the existing situation.

2. A neutral effect is when the rate of habitat degradation or improvement remains the same.

3. A negative effect is an increase in the rate of habitat degradation or a decrease or reversal of the rate of habitat improvement.

In this analysis, short-term effects are those that would be realized in less than ten years. Long-term effects would be realized after ten years. In Table S-1 (located in the Summary section of this EIS), the long-term, best-case and worst-case effects on fisheries are compared for the Proposed Action and alternatives.

Proposed Action

The environmental consequences from selection of the Proposed Action would be largely neutral for aquatic habitat in Category M and Category C allotments. The variables mentioned previously would be unlikely to change significantly from the present situation. Of the BLM aquatic habitat present in the EIS area, only a very small percentage is found in Category M and Category C allotments.

The overall consequences of selection of the Proposed Action on BLM aquatic habitat would be positive in the long term in Category I allotments. This effect would be slight to moderate, depending mostly on the number of miles and acres of habitat eventually receiving special management. Ungulate-damaged aquatic habitat in Category I allotments could receive special management to resolve livestock/aquatic conflicts. The number of areas positively affected would depend on monitoring results and criteria used to determine whether to put aquatic habitat under special management.

Selection of the Proposed Action would result in some overall improvement for habitat in Category I allotments coming under different management through AMPs and HMPs. Adjustments in livestock and wild horse numbers alone under the Proposed Action would probably not be great enough to significantly alter present levels of livestock damage to aquatic habitat. There would be positive effects

under the Proposed Action from new reservoir construction and through probable long-term reductions in sediment yields from Category I allotments.

Elimination of Livestock Grazing

Under this alternative, it is probable that nearly every mile of BLM trout stream and all BLM standing water would improve in habitat condition. Due to improved water quality and reduced stream temperatures and sediment load, some improvement of the aquatic habitat on state and private lands downstream would also occur. BLM stream habitat that is currently heavily grazed by livestock (about 25 percent of the BLM trout streams in the EIS area) would produce approximately 200 percent more trout in pounds per surface area, because of improved habitat conditions (Bowers et al., 1979). In some areas, increases in wild horse numbers would partly negate the benefits of removing livestock.

The selection of this alternative would have highly positive short- and long-term effects on most BLM game fish habitat and some positive effects on state and private habitat. Much of the positive response from the selection of this alternative would be short term because of the rapid recovery of riparian vegetation due to large reductions in ungulate grazing and trampling. In the long term, most existing BLM game fish habitat would approach its full production potential. However, this habitat would not achieve pristine conditions because of other land uses on BLM lands and the grazing and other land uses on non-BLM land in most of the affected drainages.

Enhanced Livestock Grazing

It is unlikely that large amounts of aquatic habitat would be targeted for special management as a result of this alternative, since livestock would have priority over wildlife for the use of vegetation. With development of AMPs, some positive effects on aquatic habitat could result. Gains for aquatic habitat from reduction or elimination of wild horse populations would be counteracted by increases in cattle numbers. Moderate increases in cattle numbers alone would not be likely to have significant negative effects on aquatic habitat in the EIS area. However, other livestock/forage manipulations under this alternative could lead to more livestock access to aquatic habitat that is currently not heavily damaged by livestock. The effect of this would be negative. Fisheries would benefit under this alternative if substantial change from cattle to sheep operations occurred; however, this is not the current trend. Fisheries would benefit from new reservoir construction under this alternative. Watershed conditions would be unlikely to improve enough under this alternative to affect aquatic habitat.

The overall consequences of selection of this alternative could range from slightly negative to slightly positive. Without proper planning, increased livestock access to lightly utilized riparian areas could occur and outweigh positive effects on aquatic habitat.

No Action

The effects of selection of this alternative on aquatic habitat would be neutral.

Management Based on Currently Available Forage Data

The effects of this alternative would be similar to those of the Proposed Action, except the impacts would occur more rapidly. However, currently available forage data indicates that the best use of the range in some of the EIS area would be for sheep operation. Under this alternative, some livestock operators could have economic incentive to switch to or expand sheep operations, and ungulate-damaged aquatic habitat might benefit more than under the Proposed Action.

Conclusions

Only the selection of the Elimination of Livestock Grazing alternative would greatly change game fish habitat in the EIS area. Selection of this alternative would have a highly positive effect. Selection of either the Proposed Action or the Management Based on Currently Available Forage Data alternative would have slightly to moderately positive effects. This variation in effect would be the result of variables such as monitoring studies, rancher flexibility, and habitat management criteria. The No Action alternative would have a neutral effect. The Enhanced Livestock Grazing alternative might have negative effects on aquatic habitat.

Cultural Resources

General Effects of Livestock Operations

The livestock industry, because of the widespread, vast, land-encompassing nature of the busi-

ness, is closer in a physical sense to cultural resources than most other activities in the EIS area. Because modern operators and their animals use the same lands and many of the same resources as the prehistoric and early historic inhabitants of the region, cultural resources often occur in spots being used today. Accordingly, many cultural sites have been affected by livestock operations.

Cultural resources occurring on the surface of the ground suffer from livestock trampling in varying degrees, depending on the amount of use. Most spots on open rangeland are not frequently visited by livestock, and impacts to cultural resources are only slightly adverse in these cases. However, there are locations, especially near water sources, where livestock tend to congregate and trample the surface heavily. If cultural resources occur at these locations, they are substantially affected and much of the scientific information is lost through disruption of site context and integrity and through artifact breakage (Roney, 1977).

Other effects of grazing, such as soil compaction and reduction of vegetative cover, have indirect negative influences on cultural resources. These effects contribute to increased erosion that can affect all or part of a site. This is especially true for drainage bottoms, floodplains, and hill slopes, where runoff can be significantly destructive. Artifacts and features in these settings are easily disturbed or washed away.

For purposes of this analysis, the short term is defined as occurring from the time the final EIS is published until 2 years after. The long term is open ended. In Table S-1 (located in this Summary section of this EIS), the long-term effects on cultural resources are compared.

Proposed Action

Category I Allotments. Present management of the area probably would continue in the short term until monitoring was completed, so the rate of adverse impacts on cultural resources from livestock trampling and erosion would not change during that time. After this period, some grazing capacities would be increased and some reduced, which would probably result in a net balance, and the overall rate of grazing impact on cultural resources would remain at the present level. However, sustained-yield forage would slow down erosion rates within several years. Fencing of riparian areas could help protect nearby cultural resources temporarily. Range improvement construction would probably increase in the long term, with resultant adverse effects on cultural sites. Overall, the cumulative effects of this alternative would probably be minimal to cultural resources.

Category M Allotments. The effects of this alternative on cultural resources in Category M allotments would be the same as those the livestock industry is currently having in those areas.

Category C Allotments. Cumulative impacts to cultural resources on these lands would depend on the action taken. Continuation of currently authorized use would keep impacts at present levels. Exclusion of livestock use would have a significant benefit on cultural resources due to reduced trampling. Downward adjustments in livestock numbers to counteract deteriorating range conditions would have a positive effect on cultural resources. Adjustments in seasonal use would have minimal benefits to cultural resources. If a Category C allotment were changed to a Category I allotment, based on monitoring data, the effects on cultural resources would be positive. Changing fence locations could have a positive or negative effect, depending on the location of the cultural resources. Land exchanges to form blocks of public land could have a positive or negative effect: positive if the resources remained on public land, negative if they went into private ownership. Public sale of land would be detrimental if cultural resources were lost to private interest and therefore were no longer protected under the laws pertaining to cultural resources on public lands.

Elimination of Livestock Grazing

Significant beneficial impacts to cultural resources would be realized if this alternative were implemented. Nearly all adverse impacts from present and future trampling would be reduced, especially in concentration areas. Wild horse use of these areas might occur, but impacts would be greatly reduced. Indirect impacts from livestock, such as soil compaction and increased erosion, would be alleviated in time by revegetation. Wildlife populations would be expected to increase somewhat, but not to the point of causing significant increases in impacts. ORV traffic might increase, but this would not become a significant problem for cultural resources unless widespread fence removal occurred. The overall effects of the alternative on cultural resources would be expected to be highly beneficial.

Enhanced Livestock Grazing

It is expected that enhanced livestock management might have short-term adverse impacts on cultural resources, as more areas were opened up for maximum grazing. Existing levels of livestock numbers would be maintained and probably increased somewhat; this would maintain or increase

the rate of trampling and erosion of cultural sites. The long-term impact would be an increased rate of disruption on many cultural sites from the probable increased numbers of livestock and implementation of new improvements. Cumulative impacts could be significantly adverse.

No Action

It is expected that the present situation of range condition, use, and trend would continue for the short term under this alternative. Heavy-use areas would continue to be degraded, and light-use areas would remain unchanged. The rate of impact on cultural resources would not change from present use, and higher impact rates on the cultural resources would occur in heavy-use areas than in light-use areas.

In the long term, all the impacts would continue to be the same, except that the cessation of range improvement projects would encourage uneven use of the range and accelerate the rates of trampling and erosion. Therefore, overall impact would be adverse due to deteriorating range conditions.

Management Based on Currently Available Forage Data

This alternative would probably have the same impacts as the Proposed Action, except they would occur more rapidly.

Visual Resources

General Information and Assumptions

For purposes of this analysis, the short term is defined as occurring from the time the final EIS is published until 5 years after. The long term is open ended. In Table S-1 (located in the Summary section of this EIS) the long-term effects on visual resources are compared for the Proposed Action and alternatives.

The overall effects on visual resources from the Proposed Action or any of the alternatives would be minor. The appearance of the landscape would remain essentially unchanged, and there would be no significant impact on form, line, or color of the landscape. A general discussion of the impacts associated with each of the alternatives follows.

Proposed Action

In general, windmills, fences, and livestock are a part of the western rangeland landscape. They are not normally thought of as intrusions; however, range improvement projects associated with this action could cause some minor impacts to the visual resource. For example, if new fences or water developments were located on ridges or hilltops, they would be quite noticeable and would detract somewhat from the natural appearance of the landscape. If, on the other hand, they were located so that they were not silhouetted against the sky, their impact would be relatively unnoticeable.

Elimination of Livestock Grazing

Under this alternative, the removal of livestock and range improvements would constitute a positive impact. Some range improvements would gradually disappear, resulting in a more natural appearing landscape. Some roads used strictly for livestock management would begin to revegetate. The overall impacts would be beneficial to visual resources.

Enhanced Livestock Grazing

The increase in the number of range improvements such as fencing, water development, and vegetative manipulation would adversely affect visual resources. Vegetative manipulation projects in particular could have an adverse impact if they created sharp lines of contrast on hillsides facing travel routes. As with the Proposed Action, if all range improvement projects were implemented in a manner which took into consideration visual resources, the impact would be minimized.

No Action

Under this alternative, there would be no impact to the visual resources, because no new range management projects would be implemented in the EIS area and no change in the landscape would occur.

Management Based on Currently Available Forage Data

Impacts from this alternative would be similar to those resulting from the Proposed Action, except they would occur more rapidly.

Recreation

General Information and Assumptions

For purposes of this analysis, the short term is defined as occurring from the time the final EIS is published until 5 years after. The long term is open ended. In Table S-1 (located in the Summary section of this EIS), the long-term effects on visitor days and the quality of recreation are compared for the Proposed Action and alternatives.

Impacts to recreation from the Proposed Action, the No Action alternative, and the Management Based on Currently Available Forage Data alternative would be minor. Basic patterns of recreation use would be unaffected, and the volume of recreation use would be relatively unchanged. The Elimination of Livestock Grazing and Enhanced Livestock Grazing alternatives would have significant impacts on both the quality and quantity of recreation use in the EIS area.

Proposed Action

This action would have a minimal overall impact on recreation. Use patterns and opportunities would remain unchanged from those found at present. Use volumes would be relatively unaffected, unless range improvements resulted in increased wildlife populations. Increased populations would translate into increased hunting opportunities and increased opportunities to view wildlife. If mule deer populations increased to Wyoming Game and Fish Department strategic plan levels, some increase in hunting opportunities and quality would result.

Increases in the number of fences under the Proposed Action could decrease man's mobility and freedom of movement for recreation activities in the area. With more fencing, some people would perceive the area as less wild and natural with less open space. This alternative would have little or no impact on activities such as rock collecting, camping, and picnicking.

Elimination of Livestock Grazing

This alternative would amount to removing the forage resource from the livestock industry and redistributing it to the complex of recreation and other uses. Land use competition between recreation and livestock would no longer exist and as a result, activities such as hunting, would be greatly enhanced both in terms of quality and quantity. If big game populations increased, these increases would quickly translate to increased hunting opportunities.

The removal of livestock and related livestock management facilities would return the landscape to a more natural state, much like that of the previous century. People would be able to travel through more of the public lands unrestricted by fences. Open space values would be increased. Roads previously maintained by vehicle use from the livestock industry would begin to disappear. Small tracts of private lands, ranging from 40 acres to a section or more which are now used for livestock purposes would no longer have value for that purpose. In all probability, these lands would be subdivided and sold for recreational home sites as demand materialized for this use.

Enhanced Livestock Grazing

The alternative calls for more intensive use and management of the EIS area for the production of livestock. This would have the effect of displacing recreation as we know it today. The area would continue to be used for recreation, but the quality and quantity of the recreation opportunities would be less than at present.

Under this alternative, livestock management would dominate management of the public lands. The landscape would be somewhat less natural in appearance, as a result of the adverse impact on open space values from the numerous range improvement projects.

Increased competition between recreation and livestock would occur. This would probably result in problems and conflicts not found at present. For example, the more fences found in an area, the greater the likelihood that gates would be left open by recreationists, allowing livestock to scatter. More livestock using areas such as Sweetwater Canyon would undoubtedly have an adverse effect on fishing and related activities. Vegetative manipulation projects done without consideration of wildlife would adversely affect habitat and, ultimately, hunting opportunities. Hunting opportunities and hunter success would decrease.

No Action

This alternative would have little impact on recreation. In all probability, hunting opportunities would remain essentially unchanged. If wildlife populations

increased, some slight increase in hunting opportunities and quality would result. It is expected that no impacts to open space would occur.

Management Based on Currently Available Forage Data

The impacts on recreation opportunities from this alternative would be similar to those for the Proposed Action, except they would occur more rapidly.

MITIGATION MEASURES

This section identifies possible mitigation measures which could be applied to eliminate or reduce adverse impacts of the Proposed Action or alternatives and enhance beneficial impacts. These mitigation measures are in addition to those contained as part of the Proposed Action or alternatives and the measures discussed in the Standard Operating Procedures section in Chapter 1 of this EIS.

General

If, through monitoring and evaluation, any resource was determined to be sustaining an anticipated or unanticipated negative impact as a result of implementation of any management action in the EIS area, the impact could be mitigated through implementation of resource protection actions or enhancement of similar resources in the vicinity of the impact. This mitigation would be accomplished by timely modification of AMP actions and objectives or through initiation of new management in areas outside those covered by AMPs. While the magnitude of the impact would determine the nature and extent of mitigation, some action would be taken to mitigate each impact identified.

Soils

1. A team approach involving soils personnel and specialists in other disciplines could be used to conduct field investigations when determining the location and extent of sites where livestock should be excluded from riparian areas. With this approach, areas with the maximum potential for reducing sediment yields and improving soil conditions could be selected.
2. A team approach involving soils personnel and specialists in other disciplines could be used to determine the potential for range improvement on areas being considered for vegetation conversions. In areas where soil conditions and other factors indicated that vegetation did not have the potential to return to original or better condition, conversions would not be done. Using this approach would reduce the amount of sediment yield produced on conversion sites to a minimum and would maximize improvement of soil conditions.

Vegetation

1. Meadow pussytoes populations could be monitored during the first few years after implementation of management actions to ensure that there were no adverse impacts to those populations.
2. Meadows containing meadow pussytoes could be studied to determine the effect on this species from elimination of grazing by fencing.
3. Meadow/riparian areas could be inventoried to determine where fencing would be beneficial.
4. After land treatments, grazing could be deferred at least two grazing seasons to allow reestablishment of vegetation.

Wildlife

1. Where monitoring indicated that fall and winter livestock grazing was adversely affecting the condition of mule deer or antelope winter ranges, the season of livstock use could be changed from fall and winter to spring and summer. This would increase the availability of browse forage, resulting in a reduction in the big game mortality rate.
2. Grazing of domestic sheep could be prohibited between April 15 and June 15 within a 2-mile radius of sage grouse strutting/nesting complexes. This would help alleviate the destruction of sage grousGrazing of domestic sheep could be prohibited between April 15 and June 15 within a 2-mile radius of sage grouse strut-

ting/nesting complexes. This would help alleviate the destruction of sage grouse nests and eggs caused by livestock trampling.

3. Vegetation manipulation projects could be prohibited on big game winter ranges, sage grouse winter ranges, and big game calving/lambing areas if it was determined through the environmental assessment process that such actions would significantly reduce the availability of essential forage or cover.

Wild Horses

1. Wild horse numbers and locations could be monitored annually to assess the effects of horse removals and fencing and other range improvements on the herds. A similar monitoring program is explained in the Cal-Neva EIS (Susanville District, 1981).
2. When livestock usage was not occurring in adjacent allotments, gates could be left open to allow mixing of horse bands and help prevent fence destruction.
3. Water wells in various locations could be turned on or off at certain times to encourage the horses to move to different areas. This would help prevent excessive use around water sources.

Fisheries

1. Currently, some stream-riparian areas are lightly grazed. If implementation of management actions resulted in changes in livestock distribution that caused grazing pressure to increase in these areas, the riparian areas could be fenced to mitigate impacts to fisheries.
2. If construction or repair of water developments would degrade existing fisheries habitat through dewatering, reservoirs large enough to support new fisheries could be built or rebuilt in the vicinity.

Cultural Resources

1. A Class II Cultural Inventory could be conducted area wide to determine the locations of significant cultural resources and high site density areas. Then locations for range improvements could be planned to minimize disturbance of cultural resources.
2. Inventories and monitoring in heavy-use areas could be increased to identify endangered cultural resources and determine needs for immediate site protection.
3. Widespread removal of fences (such as could possibly occur under the Elimination of Livestock Grazing alternative) could be planned so that fencing would not be removed in areas where it was necessary to protect cultural resources from ORV damage.
4. Certain areas could be closed to ORVs to protect cultural resources.
5. Public awareness and appreciation of cultural resources and the need for their protection could be encouraged.

UNAVOIDABLE ADVERSE IMPACTS

Socioeconomics

The Elimination of Livestock Grazing alternative would cause unavoidable adverse impacts to livestock operators in the area, particularly those who depend heavily on public lands. It would also result in the loss of the traditional lifestyle associated with ranching and the permanent loss of revenues to the public sector generated through grazing fees. The Proposed Action, the Enhanced Livestock Grazing alternative, and the Management Based on Currently Available Forage Data alternative could cause unavoidable adverse impacts to the aesthetic values associated with wild horse herds if reductions occurred.

Cultural Resources

An unavoidable adverse impact to cultural resources would result from the Proposed Action, the Enhanced Livestock Grazing alternative, the No Action alternative, and the Management Based on Currently Available Forage Data alternative. Where livestock would congregate, trampling would result in losses of scientific information through disruption of site context and integrity and through artifact breakage. An unavoidable adverse impact to cultural resources could also result from construction of new range improvements under the Proposed

Action, the Enhanced Livestock Grazing alternative, and the Management Based on Currently Available Forage Data alternative.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

Proposed Action

The short-term use of the land would remain the same as the present unless monitoring indicated differently. The long-term productivity of the land would increase except in some riparian areas, where overuse by wild horses and wildlife would continue to cause reduction in productivity.

Elimination of Livestock Grazing

The short-term use would change. There would be reduced grazing of grasses and increased grazing on browse and forb species. The long-term productivity of the land would increase, except in some riparian areas where overuse by wild horses and wildlife would continue to cause reduction in productivity.

Enhanced Livestock Grazing

The short-term use of the land would be intensified by increased range improvements and vegetation manipulations. There would be increased livestock grazing and reduced wildlife habitat. The long-term productivity of the land for livestock would increase because the range improvements and vegetation manipulations would upgrade the range condition.

No Action

The short-term use of the land would be unchanged. The long-term productivity would remain largely the same, with the exception of meadow and riparian areas, which would decline in productivity.

Management Based on Currently Available Forage Data

The short-term use of the land would be unchanged. The long-term productivity would increase.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The Proposed Action and all of the alternatives would result in a negligible but irreversible and irretrievable loss of soil through soil erosion. There would be no other appreciable irreversible or irretrievable commitments of resources. (In this document, the term irreversible is defined as use that is incapable of being reversed; the term irretrievable means that once something is used, it cannot be replaced.)

CHAPTER 4

CONSULTATION AND COORDINATION

LIST OF PREPARERS

Team Leader

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COORDINATION WITH OTHER AGENCIES

The following agencies were consulted or expressed interest in the Green Mountain EIS.

Federal

U.S. Department of Agriculture
- Forest Service
- Soil Conservation Service

U.S. Department of Interior
- Environmental Protection Agency
- Fish and Wildlife Service
- National Park Service

State

Wyoming Board of Land Commissioners

Wyoming Game and Fish Department

Local

Carbon County Planning and Zoning Board
Fremont County Planning and Zoning Board
Jeffrey City Town Administration

PUBLIC PARTICIPATION

The following organizations, companies, area ranchers, and individuals were consulted or expressed interest in the Green Mountain EIS.

Organizations

American Society for the Preservation of Mustangs and Burros
Green Mountain EIS Monitoring Committee
International Society for the Protection of Mustangs and Burros
Natural Resources Defense Council, Inc.
Nature Conservancy
Wild Horse Organized Assistance

Companies

Anaconda Company
Kerr-McGee Corporation
Pathfinder Mines Corporation
Western Nuclear, Inc.

Area Ranchers

Don Abernathy
Richard Allen, Double A Ranch
Don Anselmi, Howard Carroll, and Ken Ballard, Yellowstone Ranch, Inc.
Jack Armstrong, Armstrong Ranch, Inc.
James C. Arnold
Ray Axford, Thomsen Orchards, Inc.
John Barber
Richard Bieber
H. D. Branson
Edna Bringolf
Danny Brown
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James Calvert
Jack Corbett
John Countryman
Paul Crofts, Crofts Sheep Company
Edith Crone
Jack Darnell for Floyd Krebs
Lloyd Day
Pete Deal, Harpoon Cattle Company
Frank Dusl, Mr. D's North Fork Ranch
Max Ellis
Richard Ellis
Robert Ellis, Ellis Land and Livestock Company
Raymond Facinelli
Duncan Finlayson
J. B. Foster
Jack Gerard, Fremont Sheep Company
Earl Givens
Tom Graham, Graham Ranch, Inc.
Herschel Griffin, Griffin Brothers, Inc.
Richard Hamilton
Tony Malmberg, Three Quarter Circle Land and Cattle Company
Gary Martin
Ken Martinsen, Willow Creek Ranch
Gordon Maxson
George Mazet, Mazet and Sons, Inc.
Robert McClurg
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Jennifer and Joe McIntosh
Jim McIntosh
William M. McIntosh
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Roy Buchmeier
John Emmerich
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Margaret Haggard
Marv Hockley
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Ted Kelker
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Dick Loper
Joan Nice
Sam Peterson
Pam Redfield
Dave Reeder
Floyd Schweiger
D. F. Smouse
Dave Stark

APPENDIX 1

CURRENT USE IN THE EIS AREA

APPENDIX 1

CURRENT USE IN THE EIS AREA

Operator	Allotment	Class of Livestock	Federal AUMs	Lease/ Permit
A1	1703	Cattle	510	Section 3
A1	1902	Cattle	705	Section 3
A1	1903	Cattle	1,808	Section 3
A2	1901	Cattle	374	Section 3
A2	2001	Cattle	880	Section 3
A3	2202	Sheep	16	Section 15
A4	1901	Cattle	1,917	Section 3
A4	1914	Cattle	317	Section 3
A4	1922	Cattle	146	Section 3
A5	2224	Cattle	54	Section 15
B1	2208	Cattle	85	Section 15
B2	1803	Cattle	373	Section 3
B3	1911	Cattle	80	Section 3
B4	2001	Cattle	1,050	Section 3
B5	2220	Cattle	259	Section 3
B5	1912	Cattle	98	Section 3
B6	2231	Cattle	30	Section 15
B7	1803	Cattle	552	Section 3
B8	1801	Cattle	306	Section 3
B8	1802	Cattle	1,163	Section 3
B8	1809	Cattle	91	Section 3
B9	1808	Cattle	38	Section 3
C1	1911	Cattle	212	Section 3
C2	2226	Cattle	12	Section 15
C3	1703	Cattle	296	Section 3
C3	1704	Cattle	148	Section 3
C3	1712	Cattle	66	Section 3
C4	1803	Cattle	316	Section 3
C5	1401	Sheep	788	Section 3
C5	1403	Sheep	1,641	Section 3
C5	1415	Sheep	(1/)	Section 3
C5	1703	Sheep	884	Section 3
C5	1901	Sheep	373	Section 3
C6	2225	Sheep	27	Section 15
D1	2203	Cattle	47	Section 15
D1	2216	Cattle	10	Section 15
D2	1919	Cattle	398	Section 3
D3	2214	Cattle	233	Section 3
D3	2218	Cattle	38	Section 15

APPENDIX 1

CURRENT USE IN THE EIS AREA
(Continued)

Operator	Allotment	Class of Livestock	Federal AUMs	Lease/ Permit
D4	1703	Cattle	3,921	Section 3
D4	1704	Cattle	296	Section 3
D4	1711	Cattle	216	Section 3
E1	1905	Cattle	114	Section 3
E2	1904	Cattle	27	Section 3
E3	1901	Cattle	234	Section 3
E3	1905	Cattle	416	Section 3
F1	1901	Cattle	341	Section 3
F1	2001	Cattle	244	Section 3
F1	2002	Cattle	5	Section 3
F2	2212	Cattle	117	Section 3
F3	2236	Horses	24	Section 15
F4	1403	Sheep	1,440	Section 3
F4	2001	Sheep	5,714	Section 3
F4	1929	No license		
F4	2001	Sheep	5,434	Section 3
G1	2205	Cattle	40	Section 15
G2	1401	Cattle	353	Section 3
G3	1401	Cattle	133	Section 3
G3	1401	Cattle	889	Section 3
G4	1703	Cattle	3,960	Section 3
G4	1704	Cattle/Horses	904	Section 3
G4	1708	Cattle	111	Section 3
G4	1709	Cattle	427	Section 3
G4	1710	Cattle	175	Section 3
G4	1715	Horses	14	Section 3
G5	2003	Sheep	893	Section 3
G6	1403	Cattle	3,490	Section 3
G6	1806	Cattle	714	Section 3
H1	2221	Sheep	70	Section 15
H2	1803	Cattle	104	Section 3
H2	1812	Cattle	178	Section 3
H3	1801	Cattle	624	Section 3
H4	1913	Cattle	206	Section 3
H4	2204	Cattle	204	Section 3
H4	2232	Cattle	152	Section 3
H5	1901	Cattle	905	Section 3
H6	2001	Cattle	616	Section 3
H7	2201	Cattle	361	Section 3

APPENDIX 1

CURRENT USE IN THE EIS AREA
(Continued)

Operator	Allotment	Class of Livestock	Federal AUMs	Lease/ Permit
H8	2001	Cattle	3,510	Section 3
H8	2004	Cattle	651	Section 3
H9	1401	Cattle	1,941	Section 3
H9	1403	Cattle	1,416	Section 3
H9	1409	Cattle	10,415	Section 3
H9	1412	Cattle	437	Section 3
H9	1413	Cattle	452	Section 3
H9	1414	Cattle	770	Section 3
H9	1703	Cattle	451	Section 3
H9	1921	Cattle	701	Section 3
H10	1807	Cattle	105	Section 3
H10	1901	Cattle	371	Section 3
H10	1923	Cattle	81	Section 3
H10	1924	Cattle	58	Section 3
H11	1637	Cattle	165	Section 3
H11	1638	Cattle	28	Section 3
H11	2022	Cattle	425	Section 3
H12	2210	Cattle	274	Section 3
H13	1803	Cattle	399	Section 3
H14	1803	Cattle	124	Section 3
H14	1811	Cattle	474	Section 3
H15	1803	Cattle	2,280	Section 3
H15	1812	Cattle	160	Section 3
H16	2235	Cattle	35	Section 15
J1	1626	Cattle	113	Section 3
J1	1636	Cattle	633	Section 3
J2	2227	Cattle	17	Section 15
J3	1915	Cattle	2,057	Section 3
J4	1803	Cattle	511	Section 3
J4	1914	Cattle	100	Section 3
K1	1904	Cattle	383	Section 3
K1	1911	Cattle	158	Section 3
K1	1914	Cattle	280	Section 3
K1	1919	Cattle	90	Section 3
K1	2229	Cattle	56	Section 15
K2	1631	Cattle	6	Section 3
K2	1701	Cattle	1,980	Section 3
K2	1702	Cattle	51	Section 3
K2	2001	Cattle	650	Section 3
K2	2001	Cattle	1,300	Section 3
K2	2001	Cattle	480	Section 3
K2	2011	Cattle	296	Section 3
K2	2012	Cattle	377	Section 3
K2	2013	Cattle/Horses	1,727	Section 3
K2	2023	Cattle	67	Section 3
K2	2024	Cattle	16	Section 3

APPENDIX 1

CURRENT USE IN THE EIS AREA
(Continued)

Operator	Allotment	Class of Livestock	Federal AUMs	Lease/ Permit
K3	2206	Cattle	45	Section 15
L1	1409	Cattle	105	Section 3
L1	1625	Cattle/Horses	478	Section 3
L1	1636	Cattle	2,108	Section 3
L2	1909	Cattle	188	Section 3
L2	1910	Cattle/Horses	558	Section 3
L2	1911	Cattle	194	Section 3
M1	1901	Cattle	95	Section 3
M1	1904	Cattle	153	Section 3
M2	1804	Cattle	5,050	Section 3
M2	1805	Sheep	734	Section 3
M2	1917	Cattle	1,536	Section 3
M2	1918	Cattle	1,146	Section 3
M3	1803	Cattle	1,122	Section 3
M4	2001	Cattle	502	Section 3
M4	2001	Cattle	1,518	Section 3
M4	2006	Cattle	488	Section 3
M4	2025	Cattle	607	Section 3
M5	2001	Cattle	550	Section 3
M5	1632	Cattle/Horses	180	Section 3
M5	1633	Cattle	55	Section 3
M5	1634	Cattle	28	Section 3
M5	1635	Cattle/Horses	1,995	Section 3
M5	1636	Cattle	4,064	Section 3
M5	2001	Cattle	950	Section 3
M5	2014	Cattle	287	Section 3
M5	2016	Cattle	51	Section 3
M6	2001	Cattle	1,190	Section 3
M6	1622	Cattle	248	Section 3
M6	1627	Cattle	301	Section 3
M6	2001	Cattle	2,500	Section 3
M6	2010	Cattle	58	Section 3
M7	2001	Cattle	1,510	Section 3
M7	1707	Cattle/Horses	183	Section 3
M7	2001	Cattle	3,358	Section 3
M8	1904	Cattle	89	Section 3
M8	1926	Cattle	235	Section 3
M9	2001	Cattle	250	Section 3
M10	1903	Cattle	177	Section 3
M10	1914	Cattle	160	Section 3
M11	2222	Cattle	25	Section 15
M12	1623	Cattle	1,061	Section 3
M12	1636	Cattle	394	Section 3
M13	1703	Cattle	2,520	Section 3
M13	1704	Cattle/Horses	383	Section 3
M13	1705	Cattle	210	Section 3

APPENDIX 1

CURRENT USE IN THE EIS AREA
(Continued)

Operator	Allotment	Class of Livestock	Federal AUMs	Lease/ Permit
M13	1706	Cattle	35	Section 3
N1	2217	Cattle	48	Section 15
N2	1803	Cattle	374	Section 3
O1	2240	Cattle	183	Section 3
P1	1803	Cattle	750	Section 3
P2	1930	No license		
R1	2223	Cattle	17	Section 15
S1	1920	Cattle	996	Section 3
S2	2234	Sheep/Cattle	18	Section 15
S3	1801	Cattle	450	Section 3
S3	1907	Cattle	74	Section 3
S3	1908	Cattle	2,215	Section 3
S3	2219	Cattle	124	Section 3
S4	1628	Cattle/Horses	189	Section 3
S4	1660	Cattle	205	Section 3
S4	2001	Cattle	2,515	Section 3
S4	2005	Cattle	383	Section 3
S4	2007	Cattle	176	Section 3
S4	2009	Cattle	47	Section 3
S4	2001	Cattle	2,778	Section 3
S5	2213	Cattle	340	Section 3
S5	2228	Cattle/Horses	24	Section 15
S6	2207	Cattle	265	Section 3
S7	2003	No license	1,400	Section 3
S8	2211	Cattle	258	Section 3
S9	2003	Cattle	1,950	Section 3
S9	2019	Cattle	240	Section 3
S9	2020	Cattle	265	Section 3
S9	2021	Cattle	15	Section 3
S10	2001	Cattle	965	Section 3
S10	2003	Cattle	1,717	Section 3
S10	2018	Cattle	480	Section 3
T1	2230	Cattle	8	Section 15
T2	1906	Cattle	1,644	Section 3
T2	1916	Cattle	2,328	Section 3
T2	1925	Cattle	87	Section 3
T2	2001	Cattle	1,332	Section 3
T2	2015	Cattle	547	Section 3
T3	2026	Cattle	294	Section 3
Vacant	1921	No license		

APPENDIX 1

CURRENT USE IN THE EIS AREA
(Continued)

Operator	Allotment	Class of Livestock	Federal AUMs	Lease/ Permit
V1	1803	Cattle	278	Section 3
V1	1812	Cattle	178	Section 3
W1	2233	Cattle/Horses	96	Section 15
W1	1803	Cattle	767	Section 3
W2	1629	Cattle	276	Section 3
W2	1630	Cattle	135	Section 3
W2	1636	Cattle	5,385	Section 3
W3	1703	Cattle	1,580	Section 3
W3	1704	Cattle	225	Section 3
W3	1713	Cattle	126	Section 3
W3	1714	Cattle	79	Section 3
W3	1801	Cattle	1,463	Section 3
(2/)	2001	No license	1,276	Section 3
(3/)	2209	No license		Section 15
W4	1911	Cattle	131	Section 3
W5	1901	Cattle	223	Section 3
W6	1903	Cattle	538	Section 3
W6	1914	Cattle	80	Section 3
W7	1914	Cattle	887	Section 3
W7	1931	No license		
W8	2215	Cattle	220	Section 3
Y1	2001	Cattle	1,084	Section 3
Y1	1801	Sheep/Cattle	5,505	Section 3
Y1	1810		92	Section 3
Y1	1903	Cattle	946	Section 3
Y1	1927	Cattle	229	Section 3
Y1	1928	No license		
Y1	2001	Cattle	5,857	Section 3
Y1	2001	Sheep	200	Section 3
Y2	2001	Cattle	407	Section 3

1/ Included in the number of AUMs for Allotment 1401.
2/ Operator is the Wyoming Game and Fish Department; AUMs are reserved for wildlife.
3/ No operator; BLM has reserved the AUMs for wildlife.

APPENDIX 2

FORAGE DATA FOR CATEGORY I ALLOTMENTS

APPENDIX 2

PART A

METHODOLOGY USED TO DETERMINE FORAGE DEMAND AND SUPPLY

An inventory of the BLM Lander Resource Area was conducted from June 1977 to October 1979, and the data collected were used to calculate the average annual forage production to be distributed among livestock, wild horses, and wildlife. The soil vegetation inventory method (SVIM) used is described in the BLM Manual, Section 4412.14D3C(1). Study data, maps, and references from the inventory and forage designation process are available for inspection at the BLM Lander Resource Area Office.

Existing vegetation was mapped for each allotment. Within each allotment, vegetation transects were laid out to sample each vegetation type. Each transect consisted of ten to twenty weight-estimate plots. With this number of plots per transect, it was estimated that for 75 percent of the transects, the average weight of vegetation in the plots was within 25 percent of the true average weight for the vegetation type.

The data were processed by the BLM Denver Service Center. Data from weight-estimate plots were adjusted to maximum production for the season, using data from a plant phenology study conducted in 1979. Production figures were based on mature dry weights. The production figures were further adjusted to reflect the conditions of an average year for plant growth by using a climate adjustment factor based on precipitation and production data collected from 1965 to 1979, by the University of Wyoming, at study exclosures in the Green Mountain EIS area. The forage production was apportioned among livestock, wildlife, and wild horses, using a forage distribution computer model to process the weight-estimate data. For this model, the use of forage available for grazing allowable use factor (AUF) was maximized, subject to proper use factor (PUF), dietary, animal numbers, and management constraints.

An AUF for each type of grazing animal was applied to the production of each plant species to arrive at the total pounds of herbage and the percent of the plant that could be removed by grazing animals without affecting the viability of the plant. The AUFs were adjusted according to the following seasons of use: spring—March 21 through June 20, summer—June 21 through September 20, fall—September 21 through December 20, winter—December 21 through March 20.

PUFs used in the determination of forage distribution were obtained from PUF tables prepared by the BLM Lander Resource Area Office. PUFs were applied to each plant. PUFs include the amount of herbage that can be removed without damaging the plant and the preference of the grazing animal for that particular species. PUFs vary with the season of use, because plant defoliation anytime during the growing period is harmful to the plant. PUFs did not exceed 50 percent of the current year's growth.

Wildlife numbers from the Wyoming Game and Fish Department's strategic plan were used in the forage distribution process. The pounds of forage required by the following animals for one month are: cattle—780, horses—900, mule deer—103, antelope—74, sheep—150, elk—374, moose—652, and bighorn sheep—116. These figures were used to determine total forage consumed for each allotment.

The percent of suitable, potentially suitable, and unsuitable land for each vegetation type was also determined. Suitable land criteria were established only for livestock and wild horses; wildlife use was restricted to seasonal ranges, not allotment boundaries. The criteria were based on distance from water, slope, and production. Vegetation types with a production of 25 pounds per acre or less (32 acres per AUM) were considered unsuitable due to low production.

Amounts of consumptive and nonconsumptive vegetation were obtained from the forage distribution process. Forage supply as herein presented is the best currently available estimate of the present situation. Forage supply could increase or decrease, depending on management actions implemented.

PART B

CURRENT ANIMAL NUMBERS AND FORAGE DEMAND
[Forage demand is shown in pounds of air dry forage]

Allotment Number	Antelope		Mule Deer		Cattle		Horses[1/]		Domestic Sheep		Elk		Moose		Bighorn Sheep	
	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand
1401	99	88,156	122	151,204	583	3,134,040	118	1,277,550	1,602	809,805						
1403	484	316,372	100	123,940	789	4,307,940	71	768,690	2,635	2,463,720						
1409	800	544,640	165	204,506	1,704	9,303,840	366	3,962,700								
1412	59	43,948	35	43,383	363	1,415,700										
1413	67	38,014			281	1,095,900										
1415	3	2,671	8	9,909					5	126,675						
1622	28	24,931	31	38,398	292	804,024										
1623	170	111,540	42	52,046	600	3,758,040										
1635	92	81,925	119	147,496	600	1,605,240	20	216,540								
1636	454	404,269	119	147,455	1,945	9,815,676	94	1,017,720								
1701	80	71,240	31	38,414	330	1,552,122										
1703	387	344,611	283	350,664	2,206	11,184,420	83	898,920	2,216	753,435						
1705	8	7,126	20	24,792	210	163,800										
1707	32	15,473	3	3,718	553	1,091,298										
1708	14	7,289	16	19,828	49	191,100										
1709	23	11,973	20	24,782	139	758,940										
1711	6	3,123	20	24,782	18	168,480										
1713	12	5,358	20	24,782	150	117,000										
1801	929	602,671	127	157,405	714	4,472,052	120	1,299,600	4,035	3,026,250						
1802	66	58,756	77	95,409	364	1,277,640										
1803	370	329,470	366	453,633	1,429	6,721,182										
1804	770	414,052	201	249,126	1,177	5,967,390										
1805	37	32,945			255	602,706										
1807			36	35,113	102	81,978										

PART B--CONTINUED

CURRENT ANIMAL NUMBERS AND FORAGE DEMAND

Allotment Number	Antelope		Mule Deer		Cattle		Horses[1]		Domestic Sheep		Elk		Moose		Bighorn Sheep	
	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand
1811	115	68,931			102	453,492										
1812	471	321,819			113	531,492										
1901	141	73,386	134	110,416	1,195	4,194,450			2,500	700,005	47	211,497	74	289,488		
1902	52	46,302	100	123,909	289	2,351,154										
1903	245	127,517	143	177,191	734	3,452,280							14	54,768		
1904	157	83,650	270	261,414	190	666,900										
1905	12	6,246	29	23,896	168	589,680					46	176,640	8	31,296		
1906	49	43,630	128	158,599	549	2,997,540	10	63,270								
1907	6	5,343	73	70,679	54	168,480					20	45,142				
1908	79	41,114	374	362,107	588	2,627,976					440	1,146,422	28	109,536	30	41,876
1909	10	8,902	108	104,565	176	278,694										
1910	35	18,211	155	150,071	101	1,038,180	10	45,270			48	180,044	15	58,680		
1911	20	17,812	200	199,820	179	628,290					40	90,246				
1913	10	5,202			126	393,120										
1914	69	35,912	70	86,736	773	3,635,736										
1915	62	55,211	71	87,045	413	1,932,840										
1916	137	95,971	160	198,306	390	2,016,846	6	37,980								
1917	49	43,630	106	131,346	687	2,266,680										
1918	94	48,921	99	81,576	1,186	3,080,532					63	283,529	25	97,800		
1919	35	18,211	9	11,155	219	825,084										
1920	47	24,464	4	3,296	295	1,035,450							8	31,296		
1921	47	24,464	4	3,296	700	2,473,380							6	23,472		
1922			6	4,944	115	406,380							6	23,472		
1926	45	22,548	86	83,265	47	183,300										

PART B--CONTINUED

CURRENT ANIMAL NUMBERS AND FORAGE DEMAND

Allotment Number	Antelope		Mule Deer		Cattle		Horses[1]		Domestic Sheep		Elk		Moose		Bighorn Sheep	
	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand
1934			4	4,954	1	4,212										
1941					1	9,360										
2001	1,513	1,175,601	1,587	1,966,981	3,863	24,195,522	407	4,407,840	4,722	6,374,700	179	805,596	14	93,888		
2003	344	279,165	666	777,444	1,067	6,516,588	146	1,581,210	1,555	1,049,625	114	513,053				
2004	126	68,687	20	24,792	241	939,900										
2005	62	31,961			107	428,142										
2006	29	25,826	33	34,093	231	1,086,462					1	2,992				
2007	14	12,469			352	1,372,800										
2011	32	15,311			589	794,820										
2013	44	39,183	120	148,732	527	1,574,352	2	11,700			33	148,515	2	7,824	6	8,375
2015	37	16,347	60	74,366	105	428,376					66	197,472				
2018	23	11,973	60	61,985	425	1,335,984					8	23,936				
2019	12	5,728			156	490,386					1	2,992				
2021					15	11,700										
2026			47	48,554	69	324,558										
2205			3	3,327	10	31,200										
2206			5	5,181	10	35,100										
2207	8	4,159	46	23,690	66	205,920					28	81,682				
2209			13	13,030	16	75,270					22	52,098				
2210	12	6,246	36	37,564	54	211,848					46	103,748				
2211	4	2,079	23	28,500	86	203,268					69	155,696			4	5,580
2213	2	1,043	31	16,284	75	265,044					26	76,520	1	3,912	2	2,796
2214			33	34,433	58	180,960					65	146,608				
2215			40	40,664	88	171,600					52	117,286	1	3,912	3	4,188
2217			13	13,565	32	99,840					16	36,091			7	9,767

PART B--CONTINUED

CURRENT ANIMAL NUMBERS AND FORAGE DEMAND

Allotment Number	Antelope		Mule Deer		Cattle		Horses[1]		Domestic Sheep		Elk		Moose		Bighorn Sheep	
	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand	No.	Forage Demand
2218	4	2,079	7	2,863	38	29,640							2	7,824	6	8,375
2219			31	31,827	163	169,104					12	50,565	6	23,472	6	8,375
2220			50	54,250	37	202,878					74	204,802	2	7,824	5	6,983
2222			6	5,686	19	19,734										
2223			5	4,676	5	11,856										
2225			6	5,912					34	20,550						
2228			4	3,945	9	14,040	3	5,400								
2232	6	3,123	24	25,050	30	117,702					19	42,860				
2235	2	1,043			12	28,392					7	15,783				
2236							5	21,780								
2239			1	412	1	9,360										
2240			47	49,059	34	146,640					69	155,621				

[1]/The horses in allotments 1401, 1403, 1409, 1636, 1703, 1801, 2001, and 2003 are wild horses. The horses in allotments 1635, 1906, 1910, 1916, 2013, 2228, and 2236 are domestic horses.

APPENDIX 2

PART C

CURRENT TOTAL FORAGE DEMAND AND SUPPLY FOR ALL GRAZING ANIMALS
[In pounds of air dry forage]

Allotment Number	Forage Demand	Forage Supply	Allotment Number	Forage Demand	Forage Supply
1401[1/]	5,460,755	2,624,609	1920	1,094,506	837,106
1403[1/]	7,980,662	6,300,620	1921	2,524,612	772,264
1409[1/]	14,015,686	12,971,578	1922	434,796	214,088
1412	1,503,031	811,874	1926	382,713	110,517
1413	1,133,914	821,056	1934	9,166	53,679
1415	139,255	139,255	1941	9,360	1,482
1622	867,353	626,489	2001[1/]	39,020,128	32,782,058
1623	3,921,626	1,474,182	2003[1/]	10,717,085	7,626,491
1635	2,051,201	1,918,367	2004	1,033,379	784,871
1636[1/]	11,385,120	5,859,154	2005	460,103	396,689
1701	1,661,776	1,200,450	2006	1,149,373	647,542
1703[1/]	13,532,049	8,953,734	2007	1,385,269	251,695
1705	195,718	126,844	2011	810,131	216,239
1707	1,110,489	987,878	2013	1,922,482	1,256,596
1708	218,216	178,281	2015	716,561	745,327
1709	795,695	608,417	2018	1,433,878	790,052
1711	196,385	143,264	2019	499,106	197,714
1713	147,139	130,994	2021	11,700	7,332
1801[1/]	9,557,977	9,537,854	2026	373,112	181,700
1802	1,431,805	989,233	2205	34,527	14,169
1803	7,504,285	10,641,445	2206	40,281	19,377
1804	6,630,568	4,573,006	2207	315,451	145,049
1805	635,651	591,347	2209	140,398	106,312
1807	117,091	58,000	2210	359,406	129,684
1811	522,423	657,129	2211	395,123	209,701
1812	853,311	1,740,327	2213	365,599	98,254
1901	5,579,242	5,460,448	2214	362,001	121,841
1902	2,521,365	1,208,781	2215	337,650	206,532
1903	3,811,756	3,200,158	2217	159,263	104,351
1904	1,011,964	735,233	2218	50,781	31,749
1905	827,758	530,103	2219	283,343	172,162
1906	3,263,039	2,782,169	2220	476,737	318,645
1907	289,643	271,002	2222	25,420	13,950
1908	4,329,031	2,982,439	2223	16,532	23,770
1909	392,162	240,866	2225	26,462	14,490
1910	1,490,456	504,202	2228	23,385	9,177
1911	936,168	554,700	2232	188,735	77,134
1913	398,322	179,688	2235	45,218	34,404
1914	3,758,384	1,118,942	2236	21,780	9,900
1915	2,075,096	1,132,934	2239	9,772	814
1916	2,349,103	1,382,217	2240	351,320	134,147
1917	2,441,656	1,445,050			
1918	3,592,358	1,951,942	Total	201,506,782	150,526,847
1919	854,450	311,533			

[1/] Allotment containing wild horses.

APPENDIX 2

PART D

FORAGE DEMAND FOR THE PROPOSED ACTION AND ALTERNATIVES
[In pounds of air dry forage]

Allotment Number	Grazing Animals[2]	Forage Demand[1]			
		Proposed Action	Enhanced Livestock Grazing Alternative		Management Based on Currently Available Forage Data
			Cattle[3]	Sheep[4]	
1401	LS	3,943,845	2,274,138	3,149,586	1,794,645
	WH	1,277,550	44,460	30,330	433,080
	WL	239,360	1,541,588	153,683	302,520
1403	LS	6,771,660	4,506,780	6,988,110	5,242,860
	WH	768,690	1,080	14,130	433,080
	WL	440,312	255,835	383,428	492,327
1409	LS	9,303,840	11,459,994		4,303,840
	WH	3,962,700	350,820		1,212,660
	WL	749,146	834,595		749,146
1412	LS	1,415,700	736,710		724,542
	WH				
	WL	87,331	9,811		87,331
1413	LS	1,095,900	788,190		783,042
	WH				
	WL	38,014	12,543	127,155	38,014
1415	LS	126,675			126,675
	WH			16,309	
	WL	12,580			12,580
1622	LS	804,024	570,960		563,160
	WH				
	WL	63,329			63,329
1623	LS	3,758,040	1,334,346		1,310,946
	WH				
	WL	163,586			163,586
1635	LS	1,821,780	1,727,202		1,688,946
	WH				
	WL	229,421	106,143		229,421
1636	LS	9,815,676	5,280,678		5,076,864
	WH	1,017,720	292,500		411,390
	WL	551,724	507,496		526,942
1701	LS	1,552,122	1,084,434		1,082,796
	WH				
	WL	109,654	128,250		117,659
1703	LS	11,937,855	7,883,337	6,074,420	7,343,490
	WH	898,920	362,250	1,710	433,080
	WL	695,275	555,318	446,171	629,602
1705	LS	163,800	94,926		94,926
	WH				
	WL	31,918	33,844		31,918
1707	LS	1,091,298	975,936		969,150
	WH				
	WL	19,191			18,728
1708	LS	191,100	151,164		151,164
	WH				
	WL	27,117	31,782		27,117
1709	LS	758,940	571,662		571,662
	WH				
	WL	36,755	46,674		36,755
1711	LS	168,480	120,198		117,780
	WH				
	WL	27,950			25,484

APPENDIX 2

PART D--CONTINUED

FORAGE DEMAND FOR THE PROPOSED ACTION AND ALTERNATIVES

Allotment Number	Grazing Animals[2]	Forage Demand[1]			
		Proposed Action	Enhanced Livestock Grazing Alternative		Management Based on Currently Available Forage Data
			Cattle[3]	Sheep[4]	
1713	LS	117,000	100,854		100,854
	WH				
	WL	30,140	31,190		30,140
1801	LS	7,498,302	7,152,393		7,498,302
	WH	1,299,600	7,290		
	WL	760,076	586,417		760,076
1802	LS	1,277,640	835,380		835,068
	WH				
	WL	154,165	193,820		154,165
1803	LS	6,721,182	9,852,258		9,858,342
	WH				
	WL	783,103	973,708		783,103
1804	LS	5,967,390	3,917,628		3,909,828
	WH				
	WL	663,178	664,792		663,178
1805	LS	602,706	557,778		558,402
	WH				
	WL	32,945	32,945		32,945
1807	LS	81,978	42,042		41,262
	WH				
	WL	35,113	5,068		16,738
1811	LS	453,492	589,056		588,198
	WH				
	WL	68,931	68,931		68,931
1812	LS	531,492	1,422,798		1,418,508
	WH				
	WL	321,819			321,819
1901	LS	4,894,455	4,856,739	6,258,812	4,775,661
	WH				
	WL	684,787	663,515	478,566	684,787
1902	LS	2,351,154	1,045,356		1,038,570
	WH				
	WL	170,211	228,499		170,211
1903	LS	3,452,280	2,842,788		2,840,682
	WH				
	WL	359,476	446,284		304,708
1904	LS	666,900	543,192		470,808
	WH				
	WL	345,064	158,840		264,425
1905	LS	589,680	431,652		307,086
	WH				
	WL	238,078	134,867		223,017
1906	LS	3,060,810	2,586,336		2,579,670
	WH				
	WL	202,229	280,336		202,229
1907	LS	168,480	153,192		149,838
	WH				
	WL	121,164	134,364		121,164
1908	LS	2,627,976	1,499,160		1,281,384
	WH				
	WL	1,701,055	1,563,641		1,701,055

APPENDIX 2

PART D--CONTINUED

FORAGE DEMAND FOR THE PROPOSED ACTION AND ALTERNATIVES

Allotment Number	Grazing Animals[2]	Forage Demand[1]			
		Proposed Action	Enhanced Livestock Grazing Alternative		Management Based on Currently Available Forage Data
			Cattle[3]	Sheep[4]	
1909	LS	278,694	212,316		177,528
	WH				
	WL	1,083,467	11,910		63,338
1910	LS	1,083,450	702,185		134,640
	WH				
	WL	307,878	294,363		353,494
1911	LS	628,290	436,995		248,820
	WH				
	WL	307,878	215,775		305,880
1913	LS	393,120	5,202		174,486
	WH				
	WL	5,202	174,408		5,202
1914	LS	3,635,736	996,528		996,294
	WH				
	WL	122,648	164,817		122,648
1915	LS	1,932,840	990,678		990,678
	WH				
	WL	142,256	186,588		142,256
1916	LS	2,054,826	1,113,054		142,976
	WH				
	WL	294,277	212,742		294,277
1917	LS	2,266,680	1,272,102		1,270,074
	WH				
	WL	174,976	239,464		174,976
1918	LS	3,080,532	1,662,726		1,481,844
	WH				
	WL	29,366	310,231		470,098
1919	LS	1,035,450	303,732		288,054
	WH				
	WL	59,056	22,535		23,479
1920	LS	825,084	778,167		778,050
	WH				
	WL	51,232	60,690		59,056
1921	LS	2,473,380	721,032		721,032
	WH				
	WL	2,524,617	52,880		51,232
1922	LS	406,380	200,538		200,538
	WH				
	WL	28,416	16,022		13,550
1926	LS	276,900	91,260		71,760
	WH				
	WL	105,813	32,516		104,799
1934	LS	4,212	45,068		45,006
	WH				
	WL	4,954	8,674		8,673
1941	LS	9,360	1,877		1,482
	WH				
	WL				
2001	LS	30,570,222	27,959,982	35,565,029	26,555,406
	WH	4,407,840	6,300	27,068	1,407,510
	WL	4,042,066	3,472,049	3,541,020	4,508,757

APPENDIX 2

PART D--CONTINUED

FORAGE DEMAND FOR THE PROPOSED ACTION AND ALTERNATIVES

Allotment Number	Grazing Animals[2]	Forage Demand[1]			
		Proposed Action	Enhanced Livestock Grazing Alternative		Management Based on Currently Available Forage Data
			Cattle[3]	Sheep[4]	
2003	LS	7,566,213	6,537,628	9,163,737	5,037,765
	WH	1,581,210	1,074,465	8,550	508,860
	WL	1,569,662	691,470	1,487,099	1,587,518
2004	LS	939,900	691,470		691,392
	WH				
	WL	93,479	103,388		93,479
2005	LS	428,142	31,961		364,728
	WH				
	WL	31,961	364,728		31,961
2006	LS	1,086,462	604,422		600,132
	WH				
	WL	62,911	38,299		47,418
2007	LS	1,372,800	12,469		239,226
	WH				
	WL	12,469	239,226		12,469
2011	LS	794,820	201,240		200,928
	WH				
	WL	15,311	15,311		15,311
2013	LS	1,586,052	926,094		920,166
	WH				
	WL	336,430	336,430		336,430
2015	LS	428,376	526,968		451,698
	WH				
	WL	288,185	124,730		293,629
2018	LS	1,335,984	739,128		711,048
	WH				
	WL	97,894			79,004
2019	LS	490,386	190,008		188,994
	WH				
	WL	8,720			8,720
2021	LS	11,700	7,332		7,322
	WH				
	WL				
2026	LS	324,558	133,068		133,146
	WH				
	WL	48,554	48,575		48,554
2205	LS	31,200	10,842		10,842
	WH				
	WL	3,327	5,541		3,327
2206	LS	35,100	14,196		14,196
	WH				
	WL	5,181	5,181		5,181
2207	LS	205,920	105,846		80,964
	WH				
	WL	109,531	4,166		64,085
2209	LS	75,200	53,430		41,184
	WH				
	WL	13,030	57,171		65,128
2210	LS	211,848	44,382		8,658
	WH				
	WL	147,558	85,479		121,026

APPENDIX 2

PART D--CONTINUED

FORAGE DEMAND FOR THE PROPOSED ACTION AND ALTERNATIVES

Allotment Number	Grazing Animals[2]	Forage Demand[1]			
		Proposed Action	Enhanced Livestock Grazing Alternative		Management Based on Currently Available Forage Data
			Cattle[3]	Sheep[4]	
2211	LS	203,268	135,408		21,294
	WH				
	WL	191,855	102,032		188,407
2213	LS	265,044	30,888		7,722
	WH				
	WL	100,555	83,576		90,532
2214	LS	180,960	86,034		71,526
	WH				
	WL	181,041	38,782		50,315
2215	LS	171,600	40,560		40,482
	WH				
	WL	166,050	169,631		166,050
2217	LS	99,840	46,176		44,928
	WH				
	WL	59,423	68,817		59,423
2218	LS	29,640	10,530		10,608
	WH				
	WL	21,141	22,921		21,741
2219	LS	169,104	111,852		80,808
	WH				
	WL	114,239	78,839		91,354
2220	LS	202,878	112,554		53,118
	WH				
	WL	273,859	192,320		266,002
2222	LS	19,734	10,530		9,984
	WH				
	WL	5,686	3,955		3,966
2223	LS	11,856	15,366		15,366
	WH				
	WL	4,676	8,405		8,404
2225	LS	20,550	13,650	11,070	11,070
	WH				
	WL	5,912	3,420	3,420	3,420
2228	LS	19,448	4,860		5,232
	WH				
	WL	3,945	4,635		3,945
2232	LS	117,702	38,454		24,726
	WH				
	WL	71,033	38,726		52,408
2235	LS	28,392	28,860		26,442
	WH				
	WL	16,826	3,325		7,962
2236	LS	21,780	9,900		9,900
	WH				
	WL				
2239	LS	9,360			
	WH				
	WL	412	814		814
2240	LS	146,640	74,802		20,124
	WH				
	WL	204,680	83,856		114,023

APPENDIX 2

PART D--CONTINUED

FORAGE DEMAND FOR THE PROPOSED ACTION AND ALTERNATIVES

Allotment Number	Grazing Animals[2]	Forage Demand[1]			
		Proposed Action	Enhanced Livestock Grazing Alternative		Management Based on Currently Available Forage Data
			Cattle[3]	Sheep[4]	
Total		201,506,782	148,063,323	73,929,403	140,171,231

[1] For allotments containing private land, forage demand for wild horses was calculated for public land only.

[2] LS = livestock, WH = wild horses, WL = wildlife.

[3] Figures in this column show demand for livestock, wild horses, and wildlife under the Enhanced Livestock Grazing alternative if distribution favored cattle.

[4] Figures in this column show demand for livestock, wild horses, and wildlife under the Enhanced Livestock Grazing alternative if distribution favored sheep. Sheep are not licensed in all allotments.

NOTE: Under the Elimination of Livestock Grazing alternative all forage would go to wild horses and wildlife. (Exact demand figures are not available.) Under the No Action alternative, forage demand would be the same as for the Proposed Action.

PART E

ANIMAL NUMBERS AND FORAGE SUPPLY UNDER THE MANAGEMENT BASED ON CURRENTLY AVAILABLE FORAGE DATA ALTERNATIVE
[Forage supply is shown in pounds of air dry forage]

Allotment Number	Antelope		Mule Deer		Cattle		Horses[1/]		Domestic Sheep		Elk		Moose		Bighorn Sheep	
	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply
1401	99	88,156	173	214,364	209	1,141,140	40	433,080	1,602	653,505						
1403	484	316,372	142	175,955	509	2,779,140	40	433,080	2,635	2,463,720						
1409	800	544,640	165	204,506	1,704	4,303,840	112	1,212,660								
1412	59	43,948	35	43,383	186	724,542										
1413	67	38,014			201	783,042										
1415	3	2,671	8	9,909					5	126,675						
1622	28	24,931	31	38,398	204	563,160										
1623	170	111,540	42	51,696	209	1,310,946										
1635	92	81,925	119	147,496	550	1,472,406	20	216,540								
1636	454	404,269	99	122,673	1,006	5,076,864	38	411,390								
1701	80	79,240	31	38,419	230	1,082,796										
1703	387	344,611	230	284,991	1,363	6,910,410	40	433,080	2,216	753,435						
1705	8	7,126	20	24,792	122	94,926										
1707	32	15,473	3	3,255	490	969,150										
1708	14	7,289	16	19,828	39	151,164										
1709	23	11,973	20	24,782	105	571,662										
1711	6	3,123	18	22,361	13	117,780										
1713	12	5,358	20	24,782	129	100,854										
1801	929	602,671	127	157,405	714	4,472,052			4,035	3,026,250						
1802	66	58,756	77	95,409	238	835,068										
1803	370	329,470	366	453,633	2,095	9,858,342										
1804	770	414,052	201	249,126	771	3,909,828										
1805	37	32,945			236	558,402										
1807			17	16,738	41	41,262										

PART E--CONTINUED

ANIMAL NUMBERS AND FORAGE SUPPLY UNDER THE MANAGEMENT BASED ON CURRENTLY AVAILABLE FORAGE DATA ALTERNATIVE

Allotment Number	Antelope		Mule Deer		Cattle		Horses[1]		Domestic Sheep		Elk		Moose		Bighorn Sheep	
	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply
1811	115	68,931			132	588,198										
1812	471	321,819			301	1,418,508										
1901	141	73,386	134	110,416	1,161	4,075,656			2,500	700,005	47	211,497	74	289,488		
1902	52	46,302	100	123,909	128	1,038,570										
1903	245	127,517	143	177,191	604	2,840,682								54,768		
1904	157	83,650	187	180,775	134	470,808										
1905	12	6,246	29	23,896	88	307,086					46	176,640	4	16,235		
1906	49	43,630	128	158,599	461	2,516,670	10	63,270								
1907	6	5,343	73	70,679	48	149,838					20	45,142				
1908	79	41,114	374	362,107	287	1,281,384					440	1,146,422	28	109,536	30	41,876
1909	10	8,902	56	54,436	112	177,528										
1910	33	17,175	153	148,135	27	130,728	4	19,980			48	172,601	4	15,583		
1911	20	17,812	198	197,822	71	248,820					40	90,246				
1913	10	5,202			56	174,486										
1914	69	35,912	70	86,736	70	996,294										
1915	62	55,211	71	87,045	211	990,678										
1916	137	95,971	160	198,306	203	1,049,960	6	37,980								
1917	49	43,630	106	131,346	407	1,270,074										
1918	94	48,921	99	81,576	570	1,481,844					63	283,529	14	56,072		
1919	33	17,175	5	6,304	76	288,054										
1920	47	24,464	4	3,296	222	778,050							8	31,296		
1921	47	24,464	4	3,296	204	721,032							6	23,472		
1922			6	4,944	57	200,538							2	8,606		
1926	45	21,534	86	17,067	18	71,916										

PART E--CONTINUED

ANIMAL NUMBERS AND FORAGE SUPPLY UNDER THE MANAGEMENT BASED ON CURRENTLY AVAILABLE FORAGE DATA ALTERNATIVE

Allotment Number	Antelope		Mule Deer		Cattle		Horses[1/]		Domestic Sheep		Elk		Moose		Bighorn Sheep	
	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply
1934			7	8,673	11	45,006										
1941					0.2	1,482										
2001	1,177	1,380,789	1,858	2,302,225	3,222	20,180,706	130	1,407,510	4,722	6,374,700	179	805,596	3	20,147		
2003	366	297,021	667	777,444	653	3,988,140	47	508,860	1,555	1,049,625	114	513,053				
2004	126	68,687	20	24,792	177	691,392										
2005	62	31,961			91	364,728										
2006	29	25,826	18	18,592	128	600,132					1	2,992				
2007	14	12,469			61	239,226										
2011	32	15,311			149	200,928										
2013	44	39,183	120	148,732	304	908,466	2	11,700			33	148,515				
2015	53	23,399	60	74,366	111	451,698					66	195,864				
2018	23	11,973	42	43,095	226	711,048					8	23,936				
2019	12	5,728			60	188,994					1	2,992				
2021					9	7,332										
2026			47	48,554	28	133,146										
2205			3	3,327	4	10,842										
2206			5	5,181	4	14,196										
2207	8	4,092	31	16,160	26	80,964					15	43,833				
2209			13	13,030	9	41,184					22	52,098				
2210	12	6,246	34	35,380	2	8,658					35	79,400				
2211	2	1,051	21	26,080	9	21,294					69	155,696			4	5,580
2213	2	1,043	31	16,284	2	7,722					23	66,497	1	3,912	2	2,796
2214			12	12,803	23	71,526					16	37,512				
2215			40	40,664	21	40,482					52	117,286	1	3,912	3	4,188

PART E--CONTINUED

ANIMAL NUMBERS AND FORAGE SUPPLY UNDER THE MANAGEMENT BASED ON CURRENTLY AVAILABLE FORAGE DATA ALTERNATIVE

Allotment Number	Antelope		Mule Deer		Cattle		Horses[1]		Domestic Sheep		Elk		Moose		Bighorn Sheep	
	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply	No.	Forage Supply
2217			13	13,565	14	44,928					16	36,091		7,824	7	9,767
2218	4	2,079	7	2,863	14	10,608							2	587	6	8,375
2219			31	31,827	78	80,808					12	50,565	0.1	1,239	6	8,375
2220			50	54,250	10	53,118					74	203,530	0.3		5	6,508
2222			4	3,966	10	9,984										
2223			9	8,404	6	15,366										
2225			4	3,420					18	11,070						
2228			4	3,945	3	4,602	0.3	630								
2232	6	3,123	24	25,050	6	24,726					11	24,235				
2235	2	1,043			11	26,442					3	6,919				
2236							2	9,900								
2239			2	814												
2240			47	49,059	5	20,124					29	64,964				

[1] The horses in allotments 1401, 1403, 1409, 1636, 1703, 2001, and 2003 are wild horses. The horses in allotments 1635, 1906, 1910, 1916, 2013, 2228, and 2236 are domestic horses.

Note: All wild horses would be removed from Allotment 1801, because they did not exist there when the Wild Free-Roaming Horse and Burro Act of 1971 was passed.

APPENDIX 3

POTENTIAL RANGE MANAGEMENT ACTIONS FOR CATEGORY I ALLOTMENTS UNDER THE PROPOSED ACTION

POTENTIAL RANGE MANAGEMENT ACTIONS FOR CATEGORY I ALLOTMENTS UNDER THE PROPOSED ACTION

Allotment Number	Change in Forage Consumption	Change in Season of Use	Grazing Treatments	Change in Forage Use by Wild Horses	Water Development	Fencing	Monitoring	Vegetative Manipulation
1401	X		X	X	X	X	X	X
1403	X		X	X	X	X	X	X
1409	X		X	X	X	X	X	X
1412			X		X	X	X	
1413			X		X	X	X	
1415			X				X	
1622			X		X	X	X	
1623			X		X	X	X	
1635			X		X	X	X	X
1636	X	X	X	X	X	X	X	X
1701		X	X				X	X
1703	X	X	X	X			X	X
1705			X				X	
1707	X	X	X		X	X	X	
1708		X	X				X	X
1709			X		X	X	X	
1711			X				X	
1713			X	X			X	
1801			X		X	X	X	
1802			X		X	X	X	
1803			X		X	X	X	X
1804			X		X	X	X	
1805			X				X	
1807			X				X	
1811			X		X	X	X	
1812			X		X	X	X	X
1901		X	X		X	X	X	X

POTENTIAL RANGE MANAGEMENT ACTIONS FOR CATEGORY I ALLOTMENTS UNDER THE PROPOSED ACTION
(Continued)

Allotment Number	Change in Forage Consumption	Change in Season of Use	Grazing Treatments	Change in Forage Use by Wild Horses	Water Development	Fencing	Monitoring	Vegetative Manipulation
1902		X	X		X	X	X	X
1903		X	X		X	X	X	X
1904		X	X				X	
1905	X	X	X		X	X	X	X
1906			X		X	X	X	X
1907		X	X		X	X	X	
1908	X	X	X		X	X	X	X
1909			X				X	
1910	X	X	X				X	
1911	X	X	X				X	
1913			X		X	X	X	
1914		X	X		X	X	X	X
1915	X	X	X				X	
1916			X		X	X	X	X
1917			X		X	X	X	
1918	X		X		X	X	X	
1919		X	X				X	X
1920		X	X				X	X
1921		X	X				X	X
1922		X	X		X	X	X	
1926	X	X	X				X	
1934			X		X	X	X	
1941			X				X	
2001	X	X	X	X	X	X	X	
2003	X		X		X	X	X	X
2004		X	X		X	X	X	X
2005		X	X		X	X	X	X

POTENTIAL RANGE MANAGEMENT ACTIONS FOR CATEGORY I ALLOTMENTS UNDER THE PROPOSED ACTION
(Continued)

Allotment Number	Change in Forage Consumption	Change in Season of Use	Grazing Treatments	Change in Forage Use by Wild Horses	Water Development	Fencing	Monitoring	Vegetative Manipulation
2006			X				X	
2007		X	X		X	X	X	
2011		X	X		X	X	X	
2013			X		X	X	X	X
2015			X				X	X
2018	X		X				X	
2019			X				X	
2021			X				X	
2026			X		X	X	X	
2205			X		X	X	X	
2206			X		X	X	X	
2207	X		X		X	X	X	
2209			X		X	X	X	
2210	X		X		X	X	X	
2211	X		X		X	X	X	
2213	X		X		X	X	X	
2214	X		X				X	
2215	X		X		X	X	X	
2217	X		X		X	X	X	
2218			X				X	
2219	X		X		X	X	X	
2220	X		X		X	X	X	
2222			X		X	X	X	
2223			X		X	X	X	
2225			X		X	X	X	
2228			X		X	X	X	
2232	X		X				X	

POTENTIAL RANGE MANAGEMENT ACTIONS FOR CATEGORY I ALLOTMENTS UNDER THE PROPOSED ACTION
(Continued)

Allotment Number	Change in Forage Consumption	Change in Season of Use	Grazing Treatments	Change in Forage Use by Wild Horses	Water Development	Fencing	Monitoring	Vegetative Manipulation
2235	X		X		X	X	X	
2236			X		X	X	X	
2239			X		X	X	X	
2240	X		X		X	X	X	

APPENDIX 4

POTENTIAL RANGE MANAGEMENT ACTIONS FOR CATEGORY I ALLOTMENTS UNDER THE ENHANCED LIVESTOCK GRAZING ALTERNATIVE

APPENDIX 4

POTENTIAL RANGE MANAGEMENT ACTIONS FOR CATEGORY I ALLOTMENTS
UNDER THE ENHANCED LIVESTOCK GRAZING ALTERNATIVE

Allotment Number	Change in Season of Use	Grazing Treatments	Change in Forage Use by Wild Horses	Water Development	Fencing
1401		X	X	X	
1403		X	X	X	
1409		X	X		X
1412		X			
1413		X		X	
1414		X	X		
1415		X			
1622		X			
1623	X	X			
1635	X	X		X	X
1636		X	X	X	X
1701		X			
1703		X	X	X	X
1705		X			
1707	X	X			
1708		X			
1709		X		X	
1711		X			
1801		X	X	X	X
1802		X			
1803		X		X	X
1804		X		X	
1805	X	X			
1807		X			
1811		X			
1812		X			X
1901	X	X			X
1902	X	X		X	
1903	X	X			X
1904		X			
1905	X	X			
1906	X	X		X	X
1907		X			
1908	X	X			X
1909	X	X			X
1910	X	X			
1911		X			
1913		X			
1914	X	X			X
1915	X	X			
1916	X	X		X	
1917	X	X			
1918		X			
1919		X			
1920	X	X			
1921	X	X			X
1922		X			
1926	X	X			
1934		X			
1941		X			
2001	X	X	X		X
2003	X	X	X		X
2004	X	X		X	X
2005		X		X	
2006	X	X			
2007		X			
2011		X			

APPENDIX 4

POTENTIAL RANGE MANAGEMENT ACTIONS FOR CATEGORY I ALLOTMENTS
UNDER THE ENHANCED LIVESTOCK GRAZING ALTERNATIVE
(Continued)

Allotment Number	Change in Season of Use	Grazing Treatments	Change in Forage Use by Wild Horses	Water Development	Fencing
2013		X		X	
2015		X			
2018		X		X	X
2019	X	X		X	
2021		X			
2026		X			
2028		X			
2205		X			
2206		X			
2207		X			
2209		X			X
2210		X			
2211		X			
2213	X	X			
2214		X			
2215		X			
2217		X			
2218		X			
2219	X	X			
2220	X	X			
2222	X	X			
2223		X			
2225	X	X			
2228	X	X			
2235		X			
2236	X	X			
2239		X			
2240		X			

Source: Green Mountain MFP-1. (No data are available on change in forage consumption and vegetative manipulation.)

APPENDIX 5

METHODOLOGY USED TO DETERMINE SEDIMENT YIELD

APPENDIX 5

METHODOLOGY USED TO DETERMINE SEDIMENT YIELD

For the Pacific Southwest Interagency Committee (PSIAC) method of estimating sediment yields (Water Management Subcommittee, 1968), nine factors are used to determine the sediment yield rating. The sediment yield characteristic of each factor is assigned a numerical value representing its relative significance in the yield rating. The sediment yield rating is the sum of values for the appropriate characteristics for each of the nine factors.

Field data were converted from acre-feet per square mile per year to tons per acre per year by the following method, using Allotment 1805 as an example:

It had been established by PSIAC field data that sediment yield on Allotment 1805 averaged 0.548 acre-feet per square mile per year; therefore the total sediment yield for that allotment was determined by dividing the 6,698 acres in Allotment 1805 by 640 acres per square mile to equal 10.47 square miles and multiplying the 10.47 square miles by 0.548 acre-feet per square mile per year to equal 5.74 acre-feet per year. Assuming that 1 cubic foot of soil weighs 85 pounds (using 1.35 as an average bulk density), the sediment yield was then computed in the following manner: There are 43,560 square feet per acre, so 1 acre-foot of soil equals 43,560 cubic feet per acre-foot; 85 pounds of soil per cubic foot multiplied by 43,560 cubic feet per acre-foot equals 3,702,600 pounds of soil per acre-foot; 3,702,600 pounds of soil per acre-foot divided by 2,000 pounds per ton equals 1,851.3 tons per acre-foot of sediment yield. The 1,851.3 tons per acre-foot of sediment yield multiplied by the 5.74 acre-feet per year equals 10,626 tons of sediment yield per year, and the 10,626 tons per year divided by the 6,698 acres in the allotment equals 1.59 tons of sediment yield per acre per year in Allotment 1805.

Green Mountain Grazing EIS

TABLE 1-9

MAJOR GRASS SPECIES USED TO DETERMINE RANGE READINESS WITHIN THE THREE RANGE READINESS AREAS

	Species	Stage of Development Indicating Range Readiness
Area 1	Blue grass	Plants maturing, seed in dough stage
	Idaho fescue	4 to 6 inches or more in height, heading out
	Bluebunch wheatgrass	4 to 8 inches or more in height, heading out
	Needlegrass	4 to 6 inches or more in height, heading out
Area 2	Sandberg bluegrass	Plants maturing, seed in dough stage
	Bluebunch wheatgrass	4 to 8 inches or more in height, heading out
	Idaho fescue	4 to 6 inches or more in height, heading out
	Sedge	Seed formed
	Prairie junegrass	Heading out
Area 3	Sedge	Seed formed
	Sandberg bluegrass	Plants maturing, seed in dough stage
	Needlegrass	4 to 6 inches or more in height, heading out
	Thickspike	4 to 8 inches or more in height, heading out
	Western wheatgrass	4 to 8 inches or more in height
	Blue grama	Seed formed

TABLE 1-10

ADJUSTMENTS IN WILD HORSE NUMBERS UNDER THE MANAGEMENT BASED ON CURRENTLY AVAILABLE FORAGE DATA ALTERNATIVE

Herd Area	Present Inventory	Proposed Number
Muskrat Basin	460	150
East Beaver Creek	120	0
Rock Creek Mountain	132	40
Conant Creek	71	40
Dishpan Butte	87	40
Crooks Mountain	168	50
Antelope Hills	166	57
Green Mountain	219	70
Totals	1,423	447

TABLE 2-1

PRESENT WATER CONSUMPTION

	Animal Months	Gallons per Animal Month	Acre-Feet per Year
Cattle	159,048	1/ 300	146.4
Pronghorn antelope	47,800	1/ 12	1.8
Deer	46,977	1/ 12	1.7
Sheep	21,410	1/ 30	2.0
Wild horses	16,260	1/ 300	15.0
Elk	14,723	2/ 120	5.4
Moose	836	120	0.3
Bighorn sheep	806	30	0.1
Total			172.7

Evaporative Losses 3/:

300 reservoirs x 5.5 acre-feet of capacity per reservoir = 1,650 acre-feet

300 reservoirs x 5.4 acre-feet of evaporation per reservoir = 1,620 acre-feet

1/ Stoddart, Smith, and Box, 1975.
2/ BLM Manual, Section 1605, Illustration 12.
3/ Smith, 1974.

TABLE 2-4

MAJOR VEGETATION TYPES

Vegetation Type	Acres	Percent of EIS Area	Subtypes	Major Plant Species			Associated Wildlife Habitat Types[1/]
				Grasses/Grasslike	Forbs	Shrubs/Trees	
Grass	44,421	2.9	Short grass	Western wheatgrass Thickspike wheatgrass Bluebunch wheatgrass Needlegrass Sandberg bluegrass Indian ricegrass Blue grama Idaho fescue Prairie junegrass Threadleaf sedge	Phlox Wild buckwheat Pussytoes Aster	Big sagebrush Douglas rabbitbrush	Upland meadow Short grassland Sagebrush-mixed grass steppe
Meadow/Riparian	22,204	1.5	Wet meadow Riparian	Thickspike wheatgrass Quackgrass Kentucky bluegrass Tufted hairgrass Mat muhly Rushes Sedges Alkali cordgrass Inland saltgrass	Thistle Iris Lupine Phlox Horsetail Western yarrow	Rubber rabbitbrush Narrowleaf cottonwood Water birch Dogwood Common chokecherry Currant Juniper Shrubby cinquefoil Willow Big sagebrush Wild rose Aspen	Riparian grassland Willow-waterbirch riparian shrubland Aspen riparian woodland Cottonwood riparian woodland

TABLE 2-4--CONTINUED

MAJOR VEGETATION TYPES

Vegetation Type	Acres	Percent of ElS Area	Subtypes	Major Plant Species			Associated Wildlife Habitat Types[1/]
				Grasses/Grasslike	Forbs	Shrubs/Trees	
Sagebrush	1,298,909	91.0	Big sagebrush Rabbitbrush	Western wheatgrass Thickspike wheatgrass Bluebunch wheatgrass Sandberg bluegrass Indian ricegrass Threadleaf sedge Needlegrass	Phlox Wild buckwheat Lupine Pussytoes Aster Milkvetch Indian paintbrush Plains pricklypear Penstemon Vetch	Basin big sagebrush Black sagebrush Wyoming big sagebrush Douglas rabbitbrush Rubber rabbitbrush Broom snakeweed Silver sagebrush	Greasewood-sagebrush riparian shrubland Big sagebrush-rabbitbrush steppe
Greasewood/ Saltbush	12,232	0.7	Black greasewood Saltbush	Inland saltgrass Alkali sacaton Needlegrass Thickspike wheatgrass Bottlebrush squirreltail Blue grama Sandberg bluegrass	Pursh seepweed Dock Phlox Lomatium Plains pricklypear Pepperweed Globemallow	Black greasewood Big sagebrush Gardner's saltbush Winterfoot Bud sagebrush Douglas rabbitbrush Broom snakeweed Shadscale Birdsfoot sagebrush	Greasewood-sagebrush riparian shrubland Saltbush steppe Greasewood steppe

TABLE 2-4--CONTINUED

MAJOR VEGETATION TYPES

Vegetation Type	Acres	Percent of EIS Area	Subtypes	Major Plant Species			Associated Wildlife Habitat Types[1/]
				Grasses/Grasslike	Forbs	Shrubs/Trees	
Mountain Shrub	8,445	0.5	Bitterbrush Mountain mahogany Other mountain shrubs	Bluebunch wheatgrass Sandberg bluegrass Spike fescue Idaho fescue Mountain brome Threadleaf sedge	Western yarrow Violet Common dandelion Lupine Cinquefoil Arnica Balsamroot	Antelope bitterbrush Snowberry Big sagebrush Skunkbush sumac Rubber rabbitbrush Silver sagebrush Common chokecherry Wild rose Ceanothus	Bitterbrush-sagebrush steppe Mountain shrubland
Juniper	5,758	0.4	Juniper	Western wheatgrass Threadleaf sedge Bluebunch wheatgrass Idaho fescue Indian ricegrass Needlegrass Green needlegrass	Indian paintbrush Larkspur Penstemon Goldenweed	Utah juniper Commmon juniper Big sagebrush Winterfat	Juniper woodland Mountain shrubland

TABLE 2-4--CONTINUED

MAJOR VEGETATION TYPES

Vegetation Type	Acres	Percent of EIS Area	Subtypes	Major Plant Species			Associated Wildlife Habitat Types[1/]
				Grasses/Grasslike	Forbs	Shrubs/Trees	
Conifer	14,475	1.0	Lodgepole pine Limber pine Engelmann spruce Douglas fir Aspen	Bluegrasses Sedges Mountain brome Idaho fescue	Arnica Balsamroot Oregon grape Penstemon Bedstraw Vetch Hawksbeard	Limber pine Lodgepole pine Serviceberry Common chokecherry Quaking aspen Huckleberry Antelope bitterbrush Douglas fir Engelmann spruce	Limber pine woodland Quaking aspen woodland Aspen-conifer woodland Ponderosa pine-Douglas fir forest Highland conifer forest
Waste	25,736	2.0	Rock Barren Steep slope Dense timber				Limber pine woodland Juniper woodland Mountain shrubland

1/Adapted from the Standard Habitat Site Classification: Overland EIS Area, September 1981.

TABLE 2-7

GURRENT AND POTENTIAL VEGETATION PRODUCTION

	Pounds of Forage per Acre per Year											
	Foothills and Basins East MLRA						High Plains Southeast MLRA					
	Upland Sites			Meadow/Riparian Sites			Upland Sites			Meadow/Riparian Sites		
	Shrubs	Forbs	Grasses	Shrubs	Forbs	Grasses	Shrubs	Forbs	Grasses	Shrubs	Forbs	Grasses
Average current production	300	65	250	70	345	2,930	265	50	175	70	410	1,800
Predicted range for potential production at climax condition[1/]	50-80	75-175	375-600	300-810	180-540	720-4,050	110-180	90-110	630-800	300-690	230-500	1,380-4,000

1/ Production potential varies from site to site.

Source: SCS Range Site Descriptions.

TABLE 2-14

GURRENT GAME ANIMAL POPULATIONS, POPULATION OBJECTIVES, AND ACREAGES OF SEASONAL RANGES

Group or Species	Population Estimate[1]	Trend[2]	Wyoming Game and Fish Department Population Objectives[3]	Acreages (in thousands of acres) and Condition[4] of Seasonal Ranges				
				Crucial Winter	Winter	Yearlong	Summer	Other
Elk	2,550	(S)	2,550	33.6 (P-F)	50.5 (F-G)	18.9 (F-G)	20.6 (P-G)	9.0 (U)[5]
Mule deer	8,400	(I)	11,560	54.3 (F)		705.7 (F)	131.4 (F)	
Moose	225	(S)	225	45.9 (P)		10.8 (P)		
Pronghorn antelope	9,830	(S)	9,830	211.8 (P-G)		443.5 (F-G)	589.3 (P-F)	10.9 (P-F)[6]
Bighorn sheep	160	(S)	160	4.7 (F)		11.7 (U)		
Sage grouse	N.E.	(S)		75.2 (U)	105.0 (U)		215.0 (U)	
Blue grouse	N.E.	(S)				140.0 (U)		
Ruffed grouse	N.E.	(S)				180.0 (U)		
Chukar partridge	N.E.					115.8 (U)		
Hungarian partridge	N.E.					115.8 (U)		
Ducks	5,000-50,000						16.8 (U)	
Geese	200-600						3.2 (U)	

1/ N.E. indicates that no estimate is available.
2/ (S) indicates stabilized population and (I) indicates increasing population.
3/ Adjusted for the EIS area boundaries.
4/ (P) indicates poor condition, (F) indicates fair condition, (G) indicates good condition, and (U) indicates undetermined condition.
5/ Severe winter relief range.
6/ Restricted winter sites.

Source: Moneta Planning Unit URA-3, Sweetwater Planning Unit URA-3, and Wyoming Game and Fish Department's Strategic Plan for the Comprehensive Management of Wildlife in Wyoming.

Info Notes (Wyoming)
Vegetation Standard Operation Procedures: The BLM Manual, Section 4430.56, would be used as a general guide in developing trend monitoring procedures. Plant frequency and ground cover would be sampled to evaluate vegetation and soil trend. Other parameters, such as canopy, seedling, or shrub characteristics would be considered on unique areas such as riparian zones, aspen stands, and bitterbrush & mahogany thickets.

The average composition by weight of the grass vegetation type is 48% grass species, 10% forbs, and 42% shrubs. It is an important type for livestock and wild horse grazing.

Meadow/Riparian vegetation type consists of meadows, containing mostly rushes and sedges, and riparian areas, where the vegetation community consists of willows, narrowleaf cottonwoods, water birch, chokecherry, aspen, bluegrasses, sedges, and rushes. These areas are generally the areas of heaviest use due to the high quality forage and close proximity to water.

Sagebrush vegetation type is composed of 32% grass, 8% forbs, and 60% shrubs. Big sagebrush is the most common subtype of the sagebrush vegetation type. The predominant plant species include Wyoming big sagebrush, basin big sagebrush, and black sagebrush. Also included in the sagebrush vegetation type is the rabbitbrush subtype which consist mainly of Douglas rabbitbrush and rubber rabbitbrush. Major grass species in the understory are Indian ricegrass, thickspike wheatgrass, Sandberg bluegrass, needlegrass, bluebunch wheatgrass, and western wheatgrass. On summer ranges or when there is an abundance of other forage plants, sagebrush is considered and undesirable plant for livestock grazing. The understory vegetation is preferred when accessible and provides the majority of the forage for livestock. However, sagebrush can be an important plant for some wildlife species such as mule dear, pronghorn antelope, and sage grouse.

The average composition of the greasewood/saltbush vegetation type is 14% grasses, 4% forbs, and 82% shrubs. The major plant species in this type are black greasewood and Gardner's saltbush. This type occurs on low flats in saline clay soils.

The composition of mountain shrub vegetation type averages 92% shrubs, 3% grasses, and 5% forbs. The major plant species in this type are bitterbrush, snowberry, big sagebrush, and ceanothus. This type occurs on foothills on the Lander slope, Green Mountain, and Crooks Mountain. The principle use of this type is for wildlife forage.

Conifer vegetation type includes all rangeland in coniferous timber that supports grasses, forbs, or shrubs. The major overstory species in this type are lodgepole pine, limber pine, and quaking aspen. Some isolated pockets of Douglas fir and Engelmann spruce occur on Beaver Rim and Green Mountain. This type is used by big game and wild horses, primarily for cover.

Waste includes all areas of dense timber and brush which have no value for grazing domestic livestock or have such slight value that they cannot be used economically, due

to stand denseness, down timber, or sparseness of forage growth. This type also includes barren and other waste areas not located in timber or brush but so rough or inaccessible as to make their use by livestock improbable. This type may be used by wildlife for cover and food.

Mitigation Measures:
Meadow pussytoes populations could be monitored during the first few years after implementation of management actions to ensure that there were no adverse impacts to those populations. Meadows containing meadow pussytoes could be studied to determine the effect on this species from elimination of grazing by fencing.

Meadow/riparian areas could be inventoried to determine where fencing would be beneficial.

After land treatments, grazing could be deferred at least two grazing seasons to allow reestablishment of vegetation.

Soils in the Green Mountain EIS area are highly developed with generally low erosion rates. Soil is being removed in the form of sediment, through sheet and rill erosion. Sediment is deposited in stream channels and lake basins downstream. The rate of deposition ranges from 0.37-2.57 tons/acre/year.

Mitigation Measures:
A team approach involving soils personnel and specialists in other disciplines could be used to conduct field investigations when determining the location and extent of sites where livestock should be excluded from riparian areas. With this approach, areas with the maximum potential for reducing sediment yields and improving soil conditions could be selected.

A team approach involving soils personnel and specialists in other disciplines could be used to determine the potential for range improvement on areas being considered for vegetation conversions. In areas where soil conditions and other factors indicated that vegetation did not have the potential to return to original or better condition, conversions would not be done. Using this approach would reduce the amount of sediment yield produced on conversion sites to a minimum and would maximize improvement of soil conditions.

Wildlife
The abundance and species diversity of nongame wildlife is greatest in habitat types with high diversity in structure and species of vegetation. Such habitat types include wetland-riparian, aspen, juniper, limber pine, and mountain shrubland.

Overgrazing has adversely affected vegetative diversity, substantially reducing the suitability of the habitat for many species.

ELK seasonal ranges are characterized by the presence of nearly every major habitat type from sagebrush-mixed grass to highland coniferous forest. During winters when the snow depth becomes a hindrance to feeding and movement, the animals tend to concentrate on areas referred to as general winter ranges. During more severe winters, the elk become restricted to crucial winter ranges, which are the only areas where forage is accessible to the animals. This forage is found on windblown ridges and slopes and windblown stands of big sagebrush and grass vegetation. As forage becomes available, the animals move up toward higher elevation summer ranges that are forested. Decreased availability of preferred forage has cause elk to feed heavily on browse. This has placed elk in direct competition with mule deer and other big game species that are also dependent on the browse component of the forage resource.

MULE DEER preferred areas typically have a diverse mixture of woodland, mountain shrubland, sagebrush-bitterbrush, and riparian habitat types, where cover is adequate and extensive stands of preferred browse species are available. During very severe winters, the deer are restricted to crucial sinter ranges, which are the only areas where cover and browse are still relatively accessible. On many areas of mule deer winter range, riparian habitat types provide the only available cover and most of the available forage for wintering deer. The deer spread out over yearlong and summer ranges in the spring as snow cover melts and succulent green forage becomes available. Riparian habitat types along water courses are the primary fawning areas, and are generally the first to turn green in the spring, providing the water and succulent forage essential to lactating does and the security cover necessary to hide newborn fawns.

PRONGHORN ANTELOPE ranges are characterized primarily by the habitat types associated with sagebrush, grass, and greasewood/saltbush vegetation. During severe winters, deep snow forces antelope to concentrate on crucial winter ranges where sagebrush forage is more available on windswept ridges and slopes or in tall stand along drainages. Water and succulent forage are usually available to antelope on riparian sites during the driest months of the year. Lack of dependable water appears to be limiting the distribution of antelope in some parts of the EIS area. Distances as great as 40 miles are covered by many of the animals. On a yearlong basis, big sagebrush, rabbitbrush, and other browse species make up the largest part of antelope diets in the EIS area. Grass is fed upon when it first begins to turn green in the spring, because it is the only succulent forage initially available. Grass consumption is reduced drastically as soon as browse and forb species begin initial spring growth.

BIGHORN SHEEP during severe winters, are restricted to smaller areas of crucial winter range where forage is more readily accessible. Habitat types characteristic of bighorn sheep ranges are primarily those associated with grass, mountain shrub, conifer, and waste vegetation types. One lambing area has been identified in the Little Popo Agie Canyon, located on the boundary between the EIS area and the Shoshone National Forest. Grasses, grasslike sedges, and shrubs make up the largest part of a bighorn's diet in the EIS area. Cover is synonymous with escape terrain in bighorn habitat. Escape terrain is characterized by steep, rocky outcrops and cliffs adjacent to foraging area limits the amount of habitat available and thus, the size of bighorn population.

MOOSE are most abundant in the EIS area during the winter. About 80% of the winter population moves out of the area into the Shoshone National Forest as spring thawing begins and then returns in winter to concentrate on the yearlong and crucial winter ranges. Most of the moose range is wetland-riparian habitat characterized by cottonwood, aspen, and willow-riparian habitat types along drainages. Stands of lodgepole pine and aspen intermingle with sagebrush-grassland and mountain shrub vegetation on surrounding uplands. Riparian habitat types that are heavily wooded are preferred for calving. Preferred forage is primarily browse such as willow and other shrubs, with grasses and forbs making up the remainder of the diet. Aspen becomes and important source of forage for moose during winter. Forage competition between grazing animals has adversely affected the availability of forage and cover on moose ranges in the EIS. Overuse has prevented reestablishment and regeneration of the riparian woodlands, and has also reduced the availability of preferred browse forage on surrounding uplands.

Mitigation Measures:
Where monitoring indicated that fall and winter livestock grazing was adversely affecting the condition of mule deer or antelope winter ranges, the season of livestock use could be changed form fall and winter to spring and summer. This would increase the availability of browse forage, resulting in a reduction in the big game mortality rate.

Grazing of domestic sheep could be prohibited between April 15 and June 15 within a 2-mile radius of sage grouse strutting/nesting complexes. This would help alleviate the destruction of sage grouse nests and eggs caused by livestock trampling.

Vegetation manipulation projects could be prohibited on big game winter ranges, sage grouse winter ranges, and big game calving/lambing areas if it was determined through the environmental assessment process that such actions would significantly reduce the availability of essential forage or cover.

Citation for all preceding info: Green Mountain Environmental Impact Statement Draft

APPENDIX 6

SOIL PROPERTIES

APPENDIX 6

PART A

SOIL UNIT DESCRIPTIONS

V Units

The V units are areas dominated by slope classes ranging from nearly level to rolling. The soils range from poorly drained to well drained and are situated on floodplains and alluvial fans.

The V1 unit is the Youngston-Effington-Lostwells association. These soils are very deep (greater than 60 inches) and are well drained. Slope classes range from nearly level to rolling. Textures are loamy. Parent material is alluvium. Effington soils are very strongly alkaline. Erosion potential is moderate.

The V2 unit is the Lupinto-Lander association. These soils are very deep (greater than 60 inches). Lupinto soils are well drained, and Lander soils are poorly drained. Slope classes range from nearly level to undulating. Textures are loamy. Parent material is alluvium. Erosion potential is low.

The V3 unit is the Havre-Absher-Forelle association. These soils are very deep (greater than 60 inches) and are well drained. Slope classes range from nearly level to rolling. Textures are loamy. Parent material is alluvium. Absher soils are very strongly alkaline. Erosion potential is low to moderate.

T Units

The T units are areas dominated by slope classes ranging from nearly level to steep. Soils range from well drained to excessively drained and are situated on terraces, pediments, and escarpments.

The T1 unit is the Griffy-Fruita-Saddle association. These soils are moderately deep (20-40 inches) or very deep (greater than 60 inches). They are well drained. Slope classes range from nearly level to hilly. Textures are loamy. Parent materials are alluvium and weathering, interbedded sandstone and shale. Erosion potential is low to moderate.

The T2 unit is the Patent-Diamondville-Blazon association. These soils are shallow (10-20 inches), moderately deep (20-40 inches), or very deep (greater than 60 inches). They are well drained. Slope classes range from undulating to steep. Textures are loamy. Parent materials are alluvium, weathering soft shales, and interbedded sandstones. Erosion potential is moderate to high.

The T3 unit is the Bosler-Satanka-Cragosen association. These soils are shallow (10-20 inches), moderately deep (20-40 inches), or very deep (greater than 60 inches). They are well drained. Slope classes range from nearly level to hilly. Textures are fine sandy loams, sandy loams, and gravelly loams. Parent materials are alluvium and weathering, interbedded sandstones and shales. Erosion potential is moderate.

The T4 unit is the Almy-Monbutte-Rallod association. These soils are shallow (10-20 inches) or very deep (greater then 60 inches). They are well drained. Slope classes range from are nearly level to hilly. Textures are loamy and clayey. Parent materials are alluvium and weathering, interbedded sandstone and shales. Monbutte and Rallod soils are moderately to very strongly alkaline. Erosion potential is low to moderate.

The T5 unit is the Forelle-Patent-Blazon association. These soils are shallow (10-20 inches) or very deep (60 inches or greater). They are well drained. Textures are loamy. Slope classes range from undulating to steep. Parent material is alluvium, weathering soft shales, and interbedded sandstones. Erosion potential varies from low to high.

The T6 unit is the Luhon-Borollic Haplargids-Blackhall association. These soils are shallow (0-20 inches), moderately deep (20-40 inches), or very deep (greater than 60 inches). They are well drained. Textures are fine sandy loams. Slope classes range from nearly level to hilly. Parent materials are alluvium and weathered, soft, calcareous sandstones. Erosion potential is low to moderate.

The T7 unit is the Sinkson-Thermopolis association. These soils are shallow (10-20 inches) or very deep (greater than 60 inches). They are well drained. Slope classes range from undulating to steep. Textures are loamy. Parent material is weathering, red-bed sandstones and siltstones. Erosion potential varies from low to high.

The T8 unit is the Argic Cryoborolls-Typic Cryorthents association. These soils are moderately deep (20-40 inches) or very deep (greater than 60 inches) and are well drained. Slope classes range from nearly level to hilly. Textures are gravelly sandy loam, sandy loam, and loam. Parent materials are alluvium from schists and granites overlying

soft, calcareous sandstones. Erosion potential is moderate.

The T13 unit is the Zeona-Ryan Park association. These soils are very deep (greater than 60 inches) and well or excessively drained. Slope classes range from nearly level to hilly. Textures are loamy sand and loamy, fine sand. Parent materials are eolian deposits and alluvium. Erosion potential is moderate to high.

U Units

The U units are areas dominated by slope classes ranging from gentle to steep. They are well or excessively drained soils on uplands.

The U2 unit is the Typic Torriorthents-Borollic Haplargids association. These soils are shallow (10 to 20 inches), moderately deep (20 to 40 inches), or very deep (greater than 60 inches). They are well drained. Slope classes range from undulating to steep. Textures are fine sandy loam, sandy loam, and loam. Parent materials are alluvium and weathered, interbedded sandstones and shale. Erosion potential is moderate to high.

The U4 unit is the Blackhall-Carmody-rock outcrop association. These soils are shallow (10 to 20 inches) or moderately deep (20 to 40 inches). They are well drained. Slope classes range from sloping to steep. Textures are sandy loams. Parent materials are weathered sandstone and siltstones. Erosion potential is high.

The U6 unit is the Sweetrock-Ashbon-rock outcrop association. These soils are very shallow (0 to 10 inches) or shallow (10 to 20 inches). They range from well to excessively drained. Slope classes range from gentle to steep. Textures are channery loam and very stony loam. Parent materials are weathered igneous and metamorphic bedrocks. Rock outcrop is schist, gneiss, and granites. Erosion potential is moderate.

M Units

The M units are areas dominated by slope classes ranging from gently sloping to very steep. The soils are well drained.

The M2 unit is the Farlow-Duncom-Sapphire association. These soils are shallow (10 to 20 inches), moderately deep (20 to 40 inches), or very deep (greater than 60 inches). They are well drained. Slope classes range from hilly to very steep. Textures are channery loam, loam, and fine sandy loam. Parent materials are weathered limestones and sandstones. Erosion potential is moderate to high.

The M5 unit is the Irigul-Midelight-rock outcrop association. These soils are shallow (10 to 20 inches) or moderately deep (20 to 40 inches). They are well drained. Slopes classes range from undulating to steep. Textures are very channery loams. Parent materials are weathered igneous and metamorphic rocks. Rock outcrop is dominantly schist, along with granite, gneiss, and quartzite. Erosion potential is moderate to high.

PART B

EROSION POTENTIAL GUIDELINES

Erosion potential is the susceptibility of a soil to erosion when no cover is present. This potential is influenced primarily by inherent soil erodibility (K value), rainfall intensity, and slope gradient. Erosion potential classes and parameters are:

Low Erosion Potential Class—Soils which have K values less than .20, adequate depth to store most of the normal precipitation, and slope gradients of less than 15 percent.

Moderate Erosion Potential Class—Soils which have K values ranging from .20 to .40, moderate water storage capacity, and slope gradients ranging from 15 to 30 percent.

High Erosion Potential Class—Soils which have K values greater than .40, little water storage capacity, and slope gradients exceeding 30 percent.

APPENDIX 6

PART C

WIND ERODIBILITY SOIL GROUPINGS

Soil Class	Wind Erodibility Group[1/]	Dry Soil Aggregates smaller than .84 Millimeters in Diameter (percent)	Annual Soil Loss (tons/acre)
Very fine, fine, and medium sands; dune sands	1	1	310
Loamy sands; loamy fine sands	2	10	134
Very fine sandy loams; fine sandy loams; sandy loams	3	25	86
Clays; silty clays; noncalcareous clay loams and silty clay loams with more than 35 percent clay content	4	25	86
Slightly or more calcareous loams and silt loams; calcareous clay loams and silty clay loams with less than 35 percent clay content	4L	25	86
Noncalcareous loams and silty loams with less than 20 percent clay content; sandy clay loams; sandy clay	5	40	56
Noncalcareous loams and silt loams with more than 20 percent clay content; noncalcareous clay loams with less than 35 percent clay content	6	45	48
Silts; noncalcareous silty clay loams with less than 35 percent clay content	7	50	38
Very wet or stony	8	--	--

APPENDIX 6

PART C--CONTINUED

WIND ERODIBILITY SOIL GROUPINGS

1/ Group 1: Vegetation is difficult to establish, not suitable for cropland.

Group 2: Requires a combination of intensive measures to control wind erosion.

Group 3: Requires a combimation of at least two measures to control wind erosion in areas with a climate C factor less than 50.

Group 4: Requires a combination of at least two measures to control wind erosion in areas with C factor less than 50.

Group 4L: Requires a combination of at least two measures to control wind erosion in areas with a climate factor less than 50.

Group 5: Requires a combination of two measures in areas with a climate factor greater than 70.

Group 6: Requires a combination of two measures in areas with a climate factor greater than 70.

Group 7: Usually a single measure is sufficient to control wind erosion.

Group 8: No wind erosion problem.

Note: Climate factors for an area are based on the percentage of the variables used to establish the baseline climate factor of 100 for Garden City, Kansas. The climate factor for a specific area can be obtained from any U.S. Soil Conservation Service Office.

Measures used to control wind erosion include ridging bare soil, constructing windbreaks, and mulching bare soil.

Source: Erickson, 1973.

APPENDIX 6

PART D

WIND ERODIBILITY GROUP RATINGS FOR GENERAL SOILS MAP UNITS

Soils Map Unit	Wind Erodibility Group[1/]
V1 unit	
Youngston soils	4L
Effington soils	4L
Lostwells soils	5
V2 unit	
Lupinto soils	5
Lander soils	4L
V3 unit	
Havre soils	3
Absher soils	4
Forelle soils	3
T1 unit	
Griffy soils	6
Fruita soils	3
Saddle soils	3
T2 unit	
Patent soils	3
Diamondville soils	6
Blazon soils	4L
T3 unit	
Bosler soils	3
Satanka soils	3
Cragosen soils	4L
T4 unit	
Almy soils	3
Monbutte soils	3
Rallod soils	3
T5 unit	
Forelle soils	3
Patent soils	3
Blazon soils	4L
T6 unit	
Luhon soils	3
Borollic Haplargids soils	3
Blackhall soils	3
T7 unit	
Sinkson soils	4L
Thermopolis soils	4L
T8 unit	
Argic Cryoborolls soils	3
Typic Cryorthents soils	3
T13 unit	
Zeona soils	1
Ryan Park soils	2

APPENDIX 6

PART D--CONTINUED

WIND ERODIBILITY GROUP RATINGS FOR GENERAL SOILS MAP UNITS

Soils Map Unit	Wind Erodibility Group[1/]
U2 unit	
Typic Torriorthents soils	3
Borollic Haplargids soils	6
U4 unit	
Blackhall soils	3
Carmody soils	3
Rock outcrop[2/]	--
U6 unit	
Sweetrock soils	8
Ashbon soils	8
Rock outcrop[1/]	--
M2 unit	
Farlow soils	4L
Duncom soils	4L
Sapphire soils	3
M5 unit	
Irigul soils	6
Midelight soils	8
Rock outcrop[2/]	--

[1/] Wind erodibility groups are shown in footnote[1/] to the table in Part C of this appendix.
[2/] Miscellaneous land type, no wind erodibility group assigned.

GLOSSARY

ACTUAL USE. Total AUMs on a given area, allotment, pasture, etc.

AIR DRY FORAGE. Consumable vegetative matter from which all water has been removed so that only the dry plant is analyzed.

ALLOTMENT. An area designated for the use of a prescribed number and kind of livestock under one plan of management.

ALLUVIAL FAN. A fan-shaped deposit of alluvium concentrated at the foot of a steep slope.

ALLUVIUM. Sediment deposited by streams.

ANIMAL UNIT (AU). One mature (1,000 lb.) cow or the equivalent based on average daily forage consumption of 26 pounds of air dry forage.

ANIMAL UNIT MONTH (AUM). 1. The amount of forage required by an animal unit for 1 month. 2. Tenure of one animal unit for a period of 1 month.

AQUIFER. A water-bearing layer of permeable rock such as sandstone.

BENEFIT-COST RATIO. A comparison of the estimated costs of a project and the anticipated economic benefits over the life of the project. Projects with higher benefit–cost ratios have higher priority for funding.

BROWSE. 1. The tender shoots, twigs, and leaves of trees and shrubs often used as food by domestic and wild ungulates. 2. To feed or eat on browse.

BULK DENSITY. The mass of dry soil per unit bulk volume, including the air space.

CALCAREOUS. Soil or rock containing calcium salts.

CALF CROP. The number of calves weaned from a given number of cows bred, normally expressed in percent.

CANOPY. The uppermost layer of vegetation.

CARBON-14 DATING. The determination of the age of objects of plant or animal origin by measurement of the radioactivity of their carbon content. Used in archeology to date bone, wood, charcoal, and other plant and animal remains associated with human activity.

CASING. A special steel tubing welded or screwed together and lowered into a borehole to prevent entry of loose rock, gas, or liquid into the borehole or to prevent loss of circulation liquid into porous, cavernous, or crevassed ground.

CHANNERY LOAM. Loam containing thin, flat coarse fragments of limestone, sandstone, or schist, having diameters as large as 6 inches.

CLASS II CULTURAL INVENTORY. A sampling inventory used to predict locations of cultural resources for research needs or for planning activities involving areas under consideration for special management.

CLIMAX CONDITION. The condition at which a plant community has reached stability under a particular set of environmental conditions.

COMPETITION. Use of a resource by one species that reduces the availability of that resource to other species.

CONSUMPTIVE VEGETATION. The amount of forage consumed by herbivores.

CONVERSION IN KIND. The change from one kind of livestock to another (e.g., the conversion from cattle to sheep use).

COVER. A major component of wildlife habitat. Cover consists of vegetation or terrain used by wildlife for protection from predators and adverse weather conditions.

CRITERIA POLLUTANTS. Air pollutants, identified in the Clean Air Act of 1977 (42 USC 7401), for which ambient air quality standards have been established. The pollutants include total suspended particulates, ozone, carbon monoxide, and nitrogen dioxide.

CRITICAL HABITAT. Habitat essential to the survival of populations of an endangered or threatened species of wildlife.

CRITICAL PERIOD. A period of plant development considered essential to the survival of the plant.

CRUCIAL HABITAT. The portion of the living area used by a wildlife species that is essential to the survival and perpetuation of individuals or populations of that species.

CRUCIAL RANGE. An area of crucial importance to the survival of a local wildlife population during the periodic occurrence of drought or severe winter conditions.

CULTURAL MODIFICATION. Any human activity which has altered the basic elements (form, line, color, or texture) of the land.

DESIRABLE PLANTS. Plants that are palatable and productive forage species. They are normally long-lived plants, including grasses, forbs, and browse.

DETAILED RECONNAISANCE (3RD ORDER) SOIL SURVEYS. Soil surveys of this order are conducted where data on soil resources are required for management units the size of one to several medium-sized operating units (e.g., individual farms, ranches, wildlife refuges, watersheds). These surveys are commonly made during planning for extensive uses of land, such as rangeland, watershed, woodland, or cropland management.

DISCHARGE-WEIGHTED AVERAGE. A discharge-weighted average is the approximate composition of water that would be found in a reservoir containing all the water passing a given location during the water year, after thorough mixing in the reservoir. It is computed by multiplying the discharge for a sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the discharge.

DOUGH STAGE. The stage of plant growth before ripening, when seed has been produced but is soft and fleshy.

ECOLOGICAL RANGE CONDITION. The present state of vegetation on a range site in relation to the climax condition for that site. Ecological range condition is expressed as excellent, good, fair, or poor.

ECOSYSTEM. An ecological community together with its physical environment, forming an interacting system inhabiting an identifiable space.

EOLIAN DEPOSIT. Sediment or soil deposited by wind.

ESCAPE TERRAIN. Steep, rocky outcrops and cliffs used by bighorn sheep as a refuge from predators.

ESCARPMENTS. Steep cliffs formed by shifting of the earth.

EXCLOSURE. A study area enclosed by a fence which excludes grazing animals.

EXOTIC. Of foreign origin or character, not native.

FECAL COLIFORM. A group of bacteria that inhabit the intestinal tracts of people and other animals. Most pathogenic bacteria found in water are indigenous to the intestinal tract; therefore, fecal coliform can be used as a direct indication of the safety of water for drinking purposes.

FIELD CAPACITY. The percentage of water remaining in a soil two or three days after saturation and after free drainage has practically ceased.

FINE-TEXTURED SOIL. Sandy clay, slity clay, or clay.

FOLIATION. The tendency of metamorphic rocks set in parallel arrangement to split into thin sheets.

FORAGE. All browse and herbaceous food that are available to grazing animals.

FORB. An herb other than grass.

FULL FORCE AND EFFECT. Immediate implementation to the full letter of the law.

GENETIC DRIFT. Changes of gene frequency in small populations due to chance preservation or extinction of particular genes.

GNEISS. Metamorphic, coarse-grained rock with imperfect foliation.

GRAZING DECISION. Decisions reached as a result of planning and consultation. They may include adjustments in livestock grazing, development of management plans, and implementation of rangeland improvements as needed to meet multiple-use management objectives.

GRAZING SYSTEM. A systematic sequence of grazing treatment application on a pasture or allotment.

GRAZING TREATMENT. A specific type of grazing use on a given pasture or allotment.

HABITAT. The place where an animal normally lives. Generally components of habitat include food, water, cover, and living space.

HABITAT CONDITION. The present state of a habitat in relation to its suitability or value as habitat for a particular wildlife species or group of species.

HEADING OUT. When the majority of individuals of a plant species has begun producing flower heads.

HERBIVORE. A plant-eating animal, especially an ungulate.

HUNTER DAY. One person participating in any hunting activity for 12 hours.

IGNEOUS. Rock formed under intense heat.

INDUCED EMPLOYMENT. Employment level changes in agricultural service businesses

and other associated industries brought about by changes in production levels in the livestock sector.

INPUT/OUTPUT (I/O) MODEL. A computer model that measures the degree of interdependence between industries in a region. The model is used to measure changes in regional income and employment levels brought about by changes in the demand for a commodity produced by an economic sector.

INTERBEDDED. A bed, typically thin, of one kind of rock material, occurring between or alternating with beds of a different kind of rock material.

KEY SPECIES. Generally two to four of the more important forage plants in a range area. They usually furnish a good portion of the bulk of the forage on that range area, and when they are used to capacity, the entire range area is considered to be used correctly.

LIMITING RESOURCE. A particular component of wildlife habitat which when in short supply limits the potential size of the wildlife population using the resource.

LITHIC. Pertaining to stone, usually referred to in archeology as stone that has been flaked, chipped, or broken by human activity (sometimes includes ground stone artifacts).

LITTER ACCUMULATION. The deposition of plant residues on the soil surface.

MEDIUM-TEXTURED SOIL. Very fine sandy loam, loam, silty loam, or silt.

METAMORPHIC. Changes in form and mineral content of any igneous or sedimentary rock mass after its formation.

MONOLITH. A single block of stone of considerable size that is characterized by massiveness and total uniformity.

MULTIPLIER. A coefficient derived from the input-ouput model, which is an indicator of the interdependency of sectors in a regional economy.

NET REVENUE. Total revenue minus total cost.

NONCONSUMPTIVE VEGETATION. Vegetation not used by herbivores, including noxious plants and the vegetative parts needed by a plant for reproduction and physiology.

NORTHWESTERN PLAINS CULTURE AREA. A portion of the Great Plains that is unique because of its High Plains environments and cultural traditions. This area is characterized by abrupt mountain uplifts and high-elevation (4,000-7,000 feet) intermountain basins, and remains of cultures expressly adapted to this environment. The Northwest Plains Culture Area generally includes all of Wyoming, the Yellowstone and Madison River drainages of southern Montana, western South Dakota and Nebraska, the extreme southwestern corner of North Dakota, and the area along the border of northern Colorado.

POOL. The deeper, more placid, slower-moving sections of a stream.

PRODUCTION. The amount of herbaceous vegetation produced each year, expressed in pounds of air dry weight.

QUARTZITE. Sandstone which has undergone metamorphism, and silica has filled all the spaces between the quartz grains.

RANCH PLAN. A comprehensive plan designed to manage a ranch. The plan may include implementation of grazing systems, construction of range improvements, vegetation manipulations, etc.

RANGE CONDITION. The current productivity of a range as compared to the natural production capacity of that range.

RANGE IMPROVEMENT PROJECTS. Projects such as fences and stock watering structures which cause better distribution of livestock and therefore more even use of the range.

RANGE READINESS. The defined stage of plant growth at which grazing could begin under a specific management plan without causing permanent damage to vegetation or soil. This term is usually applied to seasonal ranges.

RECONNAISANCE (4TH ORDER) SOIL SURVEYS. Soil surveys of this order result in the production of soil survey maps that delineate entire communities, such as trading areas. These surveys are made for regional

planning within multicounty or multistate areas or for large watersheds having problems that exceed the jurisdiction of local political units.

RIFFLE. The shallower, more turbulent, fast moving sections of a stream.

RILL EROSION. An erosion process in which numerous small channels only several centimeters in depth are formed.

RIPARIAN. Situated on or pertaining to the bank of a river, stream, or other body of water.

RIPARIAN VEGETATION. Plants of all types that grow rooted in the water table contiguous to wetlands.

RIPPLE EFFECTS. The effects on the regional economy due to production changes in the livestock sector.

SCHISTS. Well-foliated metamorphic rocks in which flaky minerals are visable.

SCOPING. Process, involving the public, used to identify significant issues to be considered in an environmental impact statement. A public scoping meeting is held as one of the initial steps in the document preparation process.

SECTOR. An aggregate of similar industries (e.g., livestock sector, government sector, etc.).

SHEET EROSION. The removal of a fairly uniform layer of soil material from the land surface through the action of rainfall and runoff water.

SILICA. Silicon dioxide occurring in crystalline, amorphous, and impure forms (as in quartz, op layer of soil material from the land surface through the action of rainfall and runoff water.

SILICA. Silicon dioxide occurring in crystalline, amorphous, and impure forms (as in quartz, opal, and sand).

SILTATION. The degree to which silt settles out of water and blankets the bottom of a stream, lake, or reservoir.

SOIL DEPTH. Depth to bedrock, an indurated pan, or any other layer that inhibits root growth.

SOILDETACHABILITY. Commonly called the K factor, soil detachability is a measure of erodibility. Soil texture, organic matter content, permeability, structure, and amount of surface rock are the factors used to determine detachability for a bare soil.

SOIL INFILTRATION. The rate at which water enters the surface layer of soil.

SOIL POROSITY. The volume percentage of the total soil bulk not occupied by solid particles.

SOIL STRUCTURE. The combination or arrangement of primary soil particles into secondary particles, units, or peds.

SOIL TEXTURE. The relative proportions of the various soil separates in a soil.

SPLASH EROSION. The detachment and airborne movement of small soil particles caused by the impact of raindrops on soils.

STATIC ANALYSIS. An analysis at a specific point in time.

SUSPENDED SEDIMENT. Materials light enough to be carried in the zone of water flow and not settle out of this zone.

TRANSECT. A sample area in the form of a long, continuous line.

TREND. An interpretation of the direction of change in range condition resulting from various factors, primarily climate and grazing.

TURBIDITY. The degree to which light can penetrate water; a measure of water clarity which varies with the types and amounts of suspended and colloidal matter present in the water.

UNGULATES. Hoofed mammals (in this EIS, livestock and big game animals).

UTILIZATION. The proportion of the current year's forage production that is consumed or destroyed by grazing animals, usually measured in terms of use of key species.

VARIABLE COSTS. Costs that vary with the size of the operation (e.g., labor, protein supplement, etc.).

VEGETATION CONVERSIONS. Alteration of present vegetation by using fire, plowing, spraying, or other means to manipulate natural successional trends.

VEGETATION TYPE. An area having similar plant species, percent composition of those species, and uniform production.

VEGETATIVE MANIPULATIONS. Same as vegetation conversions.

VISUAL RESOURCE MANAGEMENT (VRM). The planning, design, and implementation of management objectives to provide acceptable levels of visual impacts for all BLM resource management activities.

VISUAL RESOURCE MANAGEMENT (VRM) CLASS. The degree of visual change that is acceptable within the characteristic landscape. The class is based on the physical and sociological characteristics of any given homogeneous area and serves as a management objective.

VISUAL RESOURCE MANAGEMENT (VRM) CONTRAST RATING. A method of determing the extent of visual impact for an existing or proposed activity that will modify any landscape feature (land and water form, vegetation, structures, etc.).

WATERBAR. A ridge of dirt erected to provide a barrier to wind and water, thereby reducing soil erosion.

VISITOR DAY. One person participating in a recreational activity for 12 hours.

WETLAND. Land where water is the dominant factor determining the nature of soil development and the types of plant and animal communities existing in the soil and on its surface. Riparian areas are classified as wetlands.

WILTING POINT. The level of moisture content in soil at which plants wilt and fail to recover their turgidity when placed in a dark, humid atmosphere.

WINTERKILL. Fish dieoff caused by oxygen depletion and buildup of toxic substances in lakes during winter.

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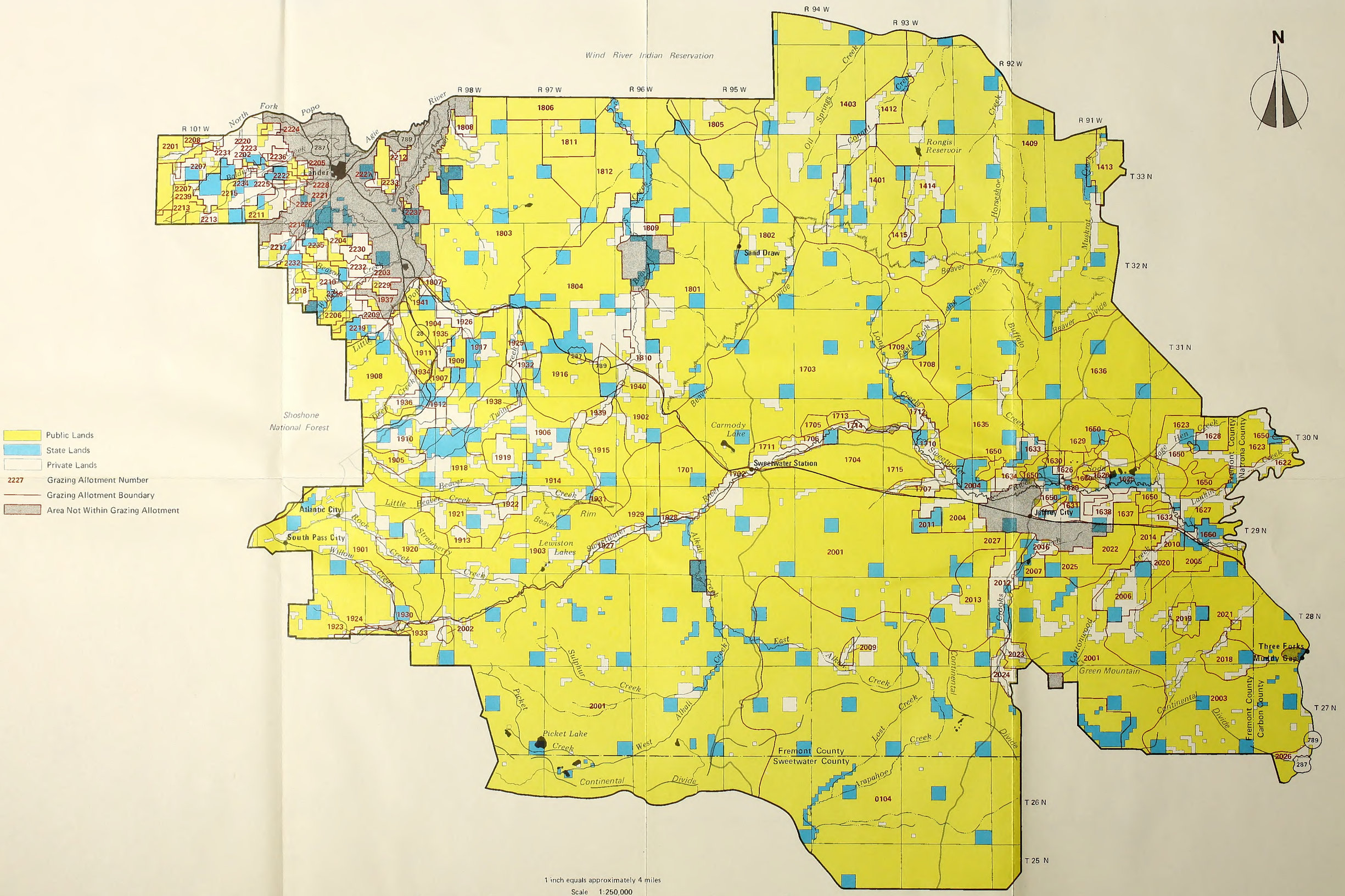
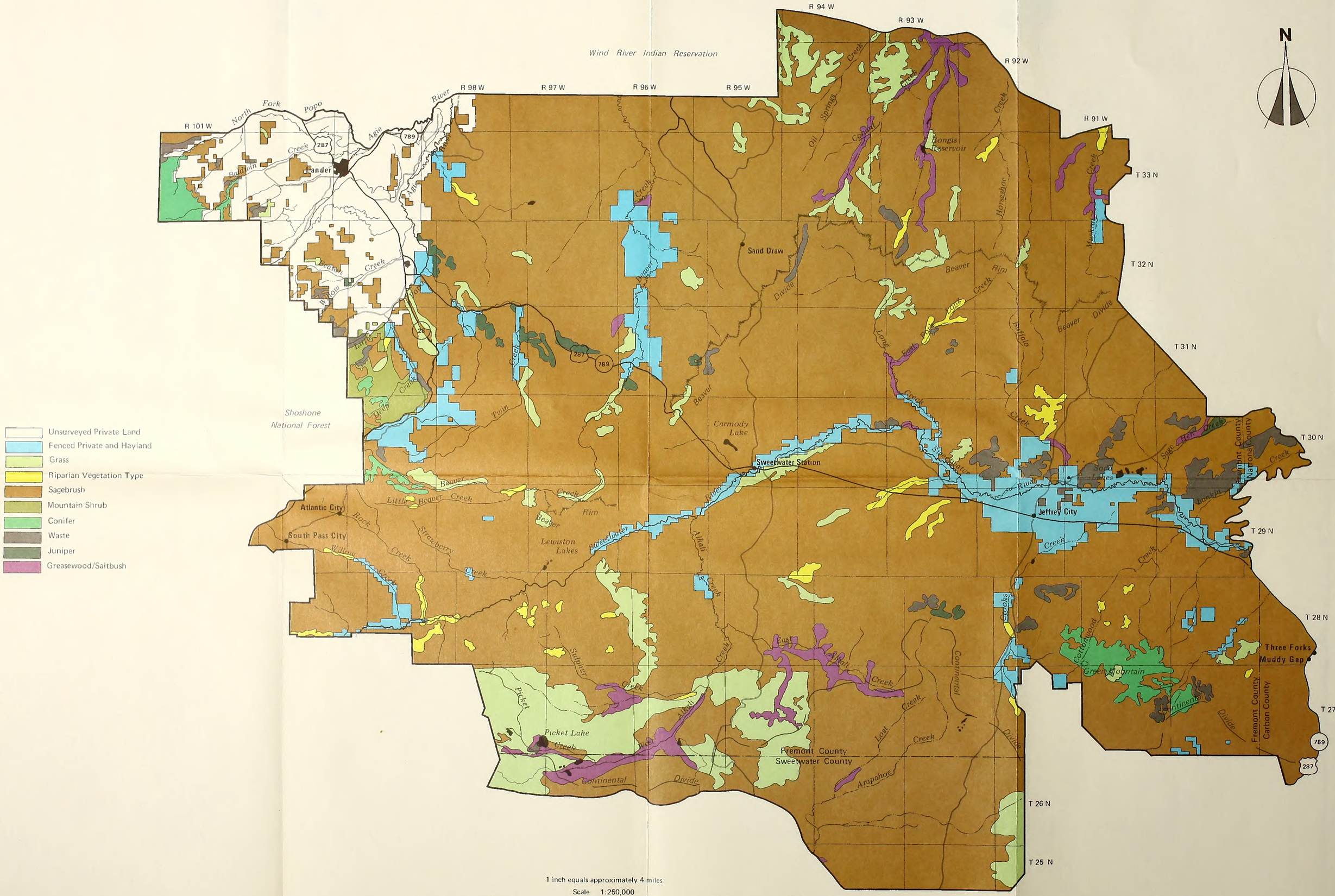


Map 1-2
LAND STATUS AND GRAZING ALLOTTMENT BOUNDARIES
Green Mountain Grazing
Environmental Impact Statement

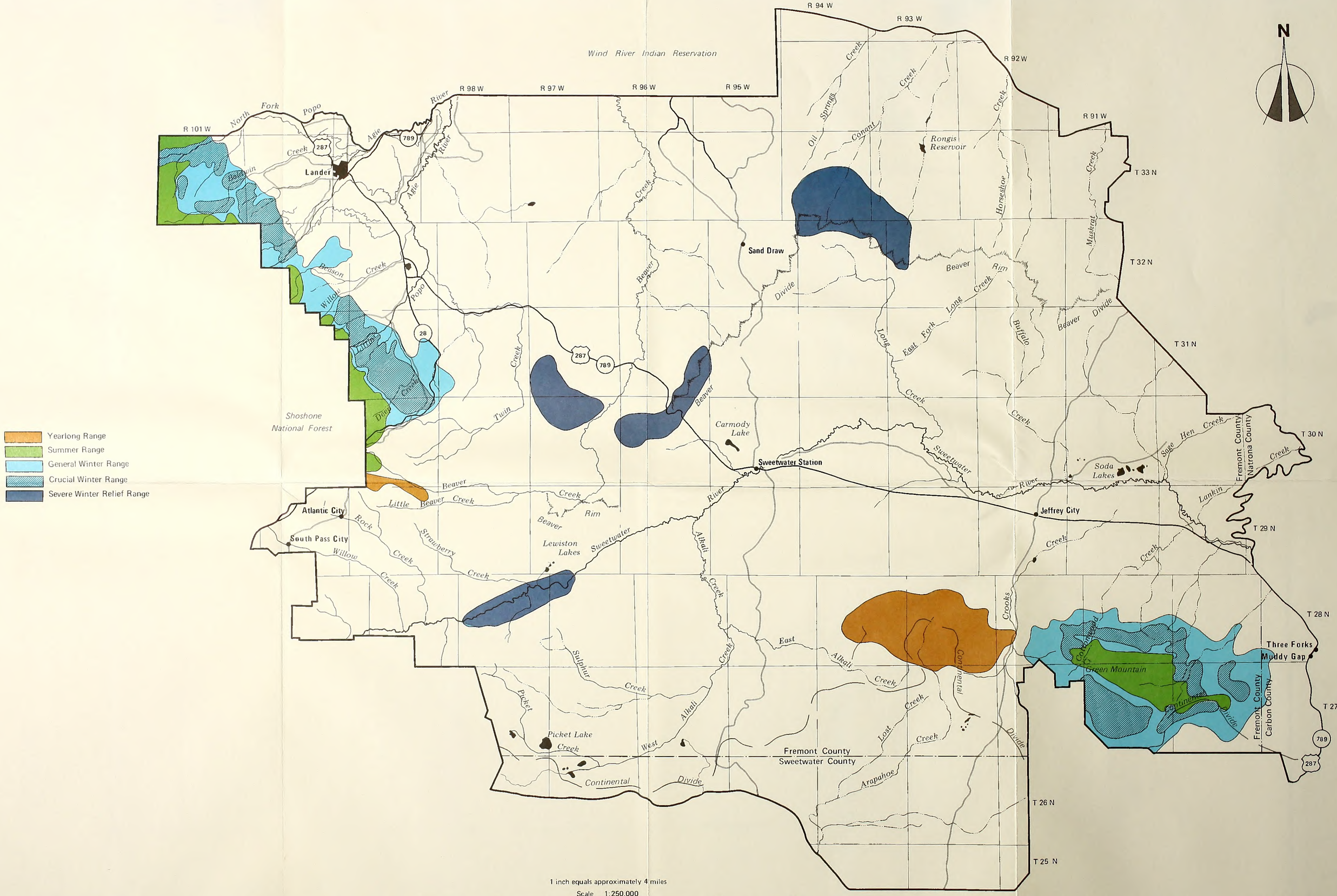
V1 Youngston–Effington–Lost Wells
V2 Lupinto–Lander
V3 Havre–Absher–Forelle
T1 Griffy–Fruita–Saddle
T2 Patent–Diamondville–Blazon
T3 Bosler–Satanka–Cragosen
T4 Almy–Monbutte–Rallod
T5 Forelle–Patent–Blazon
T6 Luhon–Borollic Haplargids–Blackhall
T7 Sinkson–Thermopolis
T8 Argic Cryoborolls–Typic Cryorthents
T13 Zeona–Ryan Park
U2 Typic Torriorthents–Borollic Haplargids
U4 Blackhall–Carmody–Rock Outcrop
U6 Sweetrock–Ashbon–Rock Outcrop
M2 Farlow–Duncon–Sapphire
M5 Iriqul–Midelight–Rock Outcrop

1 inch equals approximately 4 miles
Scale 1:250,000
5 0 5 10 15 20 Statute Miles
5 0 5 10 15 20 25 30 Kilometres

Map 2-1
GENERAL SOILS MAP
Green Mountain Grazing
Environmental Impact Statement



Map 2-3
DISTRIBUTION OF MAJOR VEGETATION TYPES
Green Mountain Grazing
Environmental Impact Statement



Map 2-4
ELK HABITAT
Green Mountain Grazing
Environmental Impact Statement

Yearlong Range
Summer Range
General Winter Range
Crucial Winter Range

N

R 101 W R 98 W R 97 W R 96 W R 95 W R 94 W R 93 W R 92 W R 91 W

T 33 N T 32 N T 31 N T 30 N T 29 N T 28 N T 27 N T 26 N T 25 N

Wind River Indian Reservation

Shoshone National Forest

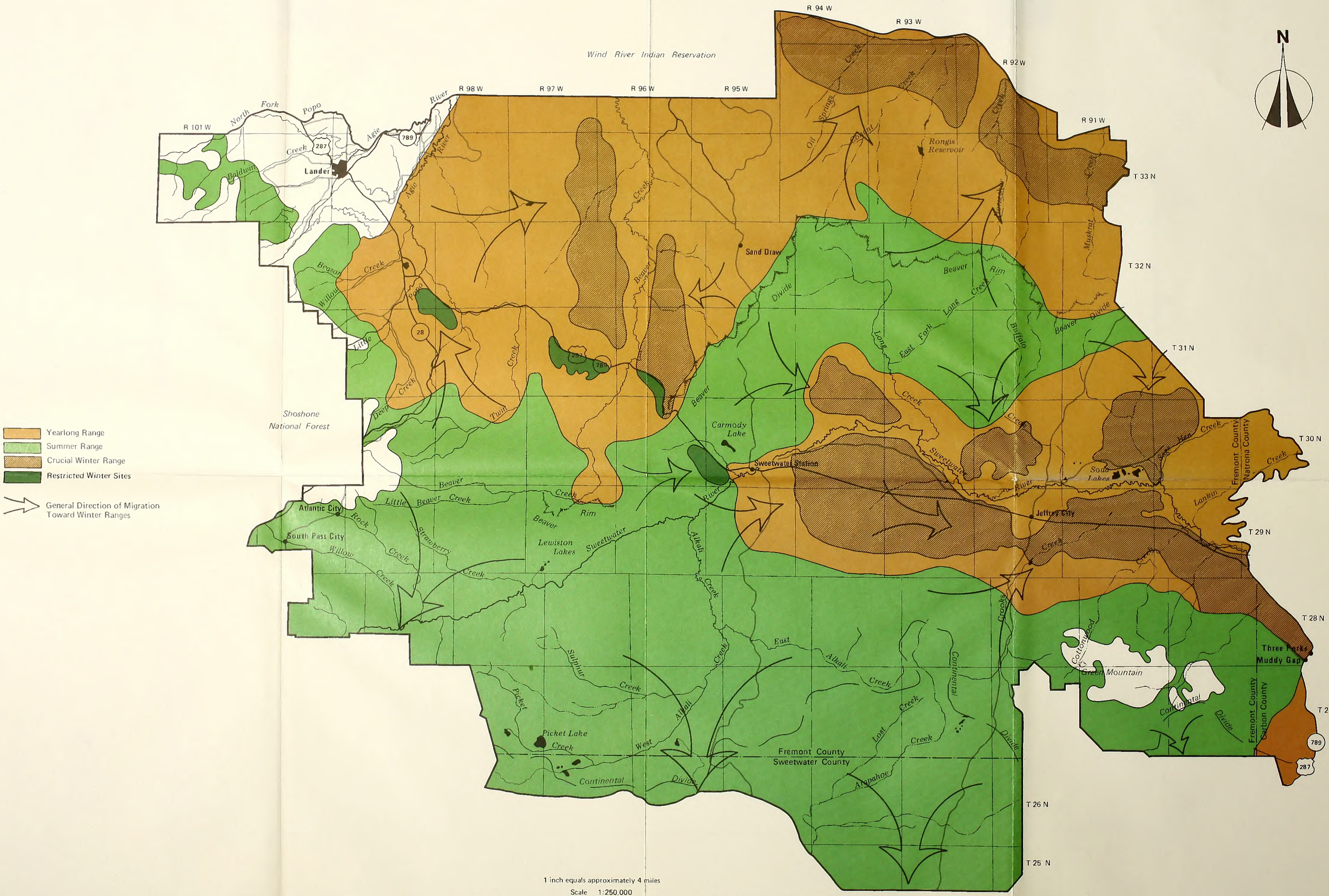
Lander
Sand Draw
Carmody Lake
Sweetwater Station
Jeffrey City
Atlantic City
South Pass City
Lewiston Lakes
Picket Lake
Soda Lakes
Three Forks
Muddy Gap
Green Mountain

Fremont County
Sweetwater County
Natrona County
Carbon County

789 287

1 inch equals approximately 4 miles
Scale 1:250,000
5 0 5 10 15 20 Statute Miles
5 0 5 10 15 20 25 30 Kilometres

Map 2-5
MULE DEER HABITAT
Green Mountain Grazing
Environmental Impact Statement



Yearlong Range
Summer Range
Crucial Winter Range
Restricted Winter Sites

General Direction of Migration Toward Winter Ranges

1 inch equals approximately 4 miles

Scale 1:250,000

5 0 5 10 15 20 Statute Miles

5 0 5 10 15 20 25 30 Kilometres

Map 2-6
PRONGHORN ANTELOPE HABITAT AND GENERAL DIRECTIONS OF MIGRATION
Green Mountain Grazing
Environmental Impact Statement

Map 2-7
BIGHORN SHEEP AND MOOSE HABITAT
Green Mountain Grazing
Environmental Impact Statement

Winter Range

Strutting/Nesting Complex

Wind River Indian Reservation

Shoshone National Forest

Fremont County
Sweetwater County

Fremont County
Carbon County

Fremont County
Natrona County

Lander
Atlantic City
South Pass City
Sand Draw
Sweetwater Station
Jeffrey City
Three Forks
Muddy Gap
Picket Lake
Carmody Lake
Lewiston Lakes
Soda Lakes
Ronglo Reservoir

R 101 W
R 98 W
R 97 W
R 96 W
R 95 W
R 94 W
R 93 W
R 92 W
R 91 W

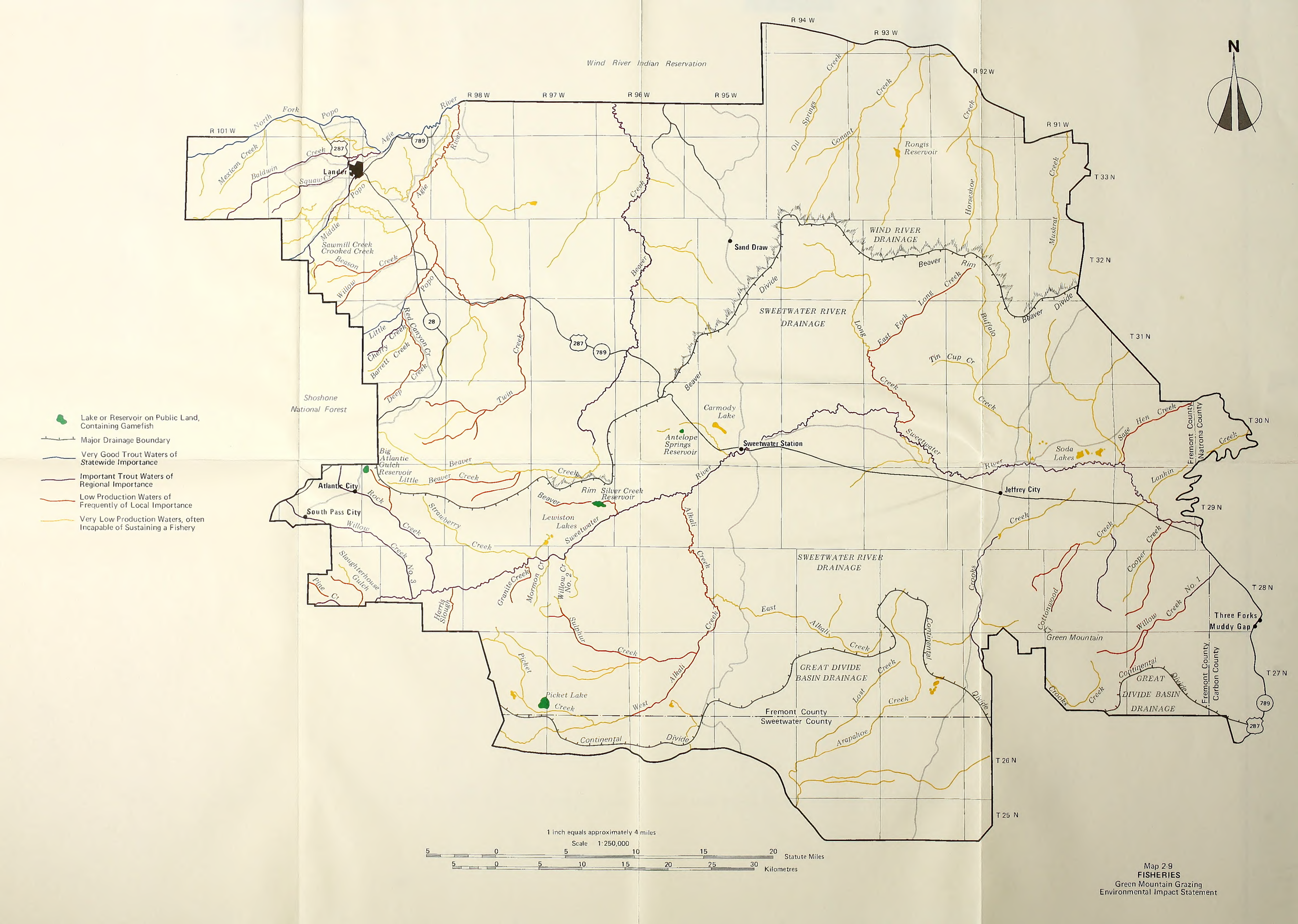
T 33 N
T 32 N
T 31 N
T 30 N
T 29 N
T 28 N
T 27 N
T 26 N
T 25 N

N

1 inch equals approximately 4 miles
Scale 1:250,000

5 0 5 10 15 20 Statute Miles
5 0 5 10 15 20 25 30 Kilometres

Map 2-B
SAGE GROUSE WINTER RANGES AND STRUTTING/NESTING COMPLEXES
Green Mountain Grazing
Environmental Impact Statement



Map 2-9
FISHERIES
Green Mountain Grazing
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